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EDUCATION AND BRAIN DEVELOPMENT:

A PSYCHOLOGICAL PROBLEM.

BY

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THE full advantages which the amended Education Bill will confer on the nation can only be realized during the next generation, when the present race of boys and girls will have arrived at maturity, and will have become capable of taking the governance into their own hands. Meanwhile much depends upon the method of teaching; and in that regard there seems to the writer to be a want of appreciation among some of those in authority of the great part the biological development of a child's brain must take in all such work. The need there must always be of suiting the crop to the soil; of eradicating the twining vetches of fancy, ever ready to sprout in the illiterate brain, and of substituting for them those "seedlings of observance," the grist of fact.

A Developmental Quadrilogy.

From Hesiod to Varro, from Lucretius to Shakespeare,* poets have dabbled fondly with the various ages through which an elderly man must pass. More recently biochemists have reverted to the same subject. The writer offers in the present article a further instalment. Ontogeny suggests that during embryonic and fetal life each one of us has passed through a brief replica of phylogenetic evolution from a simple life to the complexities of a modern existence. The change, clearly marked by the developmental phases of the nervous system, is mainly due to secretions from endocrine glands, and their action upon the growing tissues. After birth this process continues, and it may be traced to the need for information of the body's position in space, and for the further need of bringing that information under the control of the afferent nerves. The method adopted will be fully explained elsewhere. The developmental phases may be divided into four: (1) The automatic; organic, vegetative. (2) The instinctive; intuitive. (3) The emotional (due to "restrained impulse"). (4) The rational; reflective. Yet we must not suppose that the more recently formed elements tyrannously dominate and suppress the activities of the earlier ones, but that by a harmonious co-operation between them the best functional results are obtained.

The Automatic Phase.

Throughout our lives many of the most important functions of our bodies are carried on automatically—that is, unconsciously. It is not necessary to dwell upon this phase. The infant's nervous system for the first three or four months of life is apparently indifferent to any but hereditary influences. All his movements are automatic, and education can accomplish little to right what is wrong at this early age. All activities are under the joint control of a linked system of metameres, represented by the grey matter of the spinal cord, associated with the sympathetic nerves and ganglia, and also with the myenteric plexuses, those islets of ganglionic tissue which suggest "that thoughts may arise in a man's bowels as well as impulses suggesting ideas."[1]

The Intuitive Phase.

Palaeontologists can only conjecture how an anthropoidal brain has seemingly been transferred from a position above the archienteric tube to a polar one more nearly in line with the metameric linkage above mentioned. The tube itself presumably before being scrapped was converted into a "spinal canal." In phylogeny obsolete organs by such conversion are occasionally offered a new lease of life, maybe one more in accord with an existing phase of development. We retain within our bodies many samples of this evolutionary (or is it "revolutionary"?) change—among others the pineal gland, the vermiform appendix, perhaps, too, the nasopharynx!

As regards its nervous equipment the twentieth century European infant for three or four months, in its relations to its surroundings, resembles one of the lower vertebrates (a Dipnoan, for instance), whose nervous equipment for a life-long existence in this wicked world consists of these very ganglia! True volitional acts are absent. Perhaps the nearest approach to voluntary movement is to be found in the "purposive reflexes" of this period. Its movements if not automatic are still under the régime of a polar bulb (the medulla oblongata and its ganglia), in the metameric system of spinal nerves. The lip, palmar grip, and plantar (extensor) reflexes disappear, or change their significance as years roll on. The last two in so doing strengthen the evidence otherwise attainable from geology and anatomy, which points with no uncertain finger to man's quadrumanous ancestry in the far-distant past.[2] Education at this stage of an infant's life must be restricted to its mother and its welfare. Smell and taste are fairly well developed during the first few weeks of life; but the alimentary system is quite incapable of assimilating starch food until the eleventh month "owing to the absence of amylolytic power in the saliva and pancreas" (Still). Breast-fed babies start the race of life under the most favourable conditions.

At the age of 3 or 4 months the child usually holds up its head for the first time voluntarily, and the movement presumably marks the beginning of a régime of the basal ganglia in front of the pyramids. Babinski has shown how, in the adult, disease of the pyramidal tracts—the paths along which voluntary impulses pass to the spinal cord—effects changes in the plantar response. Loss of the normal dorsal flexion in that case means injury to nerve centres above the tracts; in other words, "the separation of the propriospinal apparatus from the ne-encephalic elements" (Astwazaturof). In the baby's case the active intervention of the cerebral cortex to control the lower (propriospinal) nerve plexuses is at this stage of ontogenetic development most improbable, yet the extensor response is normal up to the sixth month; from that month onward to the eighteenth plantar and dorsal flexion are equally common. In the adult these results might presumably mean many esoteric lesions to the alienist. I must leave them at that. In our babies it simply means that the little fellow is striving to stimulate his bulbar ganglia to functionate efficiently. A healthy child does so during the next twelvemonth. The conjecture is strengthened when we remember that the funiculus and the tubercle of Rolando are greyish in colour, and are better marked in the child than in the adult.

During the first few months of automatic life the afferent nerve centres gradually assume their functions. The eyes and nose learn to differentiate between the varying waves of light and the many odour-bearing molecules. The skin, too, quickly recognizes the variations of temperature and the soft caress. Usually full functional efficiency is a gradual process. Each advance is made at a fairly definite date. Take the eyesight, for instance. Within a few weeks of birth most children are pleased at a bright light. "He is long in being able to distinguish colours." When twelve months old he may know red from yellow, but he will not recognize blue and green until he is two or three years old (J. Thomson, M.D.). If there are three groups of colour sensation—red-green, yellow-blue, and white-black—and if our perception of colour rests primarily on the metabolism of a special substance in the visual mechanism of each group (Hering), the katabolic effect of white, yellow, and red light on the visual (retinal?) tissues is evidently sooner noticed by the polar nerve centres of an infant's brain than are the slower anabolic results of the shorter (chemical) rays. If the fundamental difference of maleness and femaleness depends upon a difference "in the ratio of katabolic and anabolic processes," as seems probable, metabolism has much to answer for.[3]

The Emotional Phase.

If we exclude the cerebral hemispheres, the cerebellum with its appendages is the largest association-complex in man's central nervous system, yet until recently it has received scant attention from physiologists. Palaeontology clearly indicates that the vertebrate cerebellum was structurally differentiated long before the neopallium, and in the central nervous system a lobe must be fairly complete structurally before it can function efficiently. The cerebellum is usually considered to be an outgrowth from the oriented linkage of basospinal ganglia around the central endings of certain afferent nerves "which bring

* Hesiod and Lucretius treat of the phylogeny of man for the most part; the others of his ontogenetic development.

into the nervous system special information" about the body's environment, and its functions are to co-ordinate and supervise that information before distributing it to those lower ganglia directly concerned in activating the peripheral neuro-muscular apparatus.[4] The exact period in the life of a growing child when its voluntary movements are mainly, if not entirely, dominated by the cerebellum has not yet been fully defined. On the other hand, the cerebellum of some of the lower vetebrates is the largest collection of neuro-muscular association areas in the brain, and it undoubtedly dominates and supervises their voluntary muscular activities. For these reasons the anatomy and, so far as is known, the psychology of two groups of vertebrates—namely, the large class of birds, and the armadillos (the digitigrade Dasypods of the so-called Edentate family), will be very briefly reviewed.

The Cerebellar "Worm" in Avian Life.

(*a*) The birds apparently became separated from the reptiles in early Mesozoic times. They are sharply differentiated from the latter by the possession of feathers, and by their high tissue metabolism. All birds are bipeds, and the majority (Carinatae) are fliers. The general shape, structure, and the functions of their bodies are in that case adapted for flight. The skeleton, lightened by many air cavities, is much ankylosed, and is strengthened by bony outgrowths for the support of the great central limb muscles. The joint movements, too, are in many cases definitely restricted in range and direction. The motions of the hand, for instance, are limited "to those of abduction and adduction necessary for the folding up and expansion of the wing; the hand is thus fixed in a state of pronation" (Owen).

(*b*) The organs of sight and hearing are as a rule well developed, but the senses of smell, touch, and taste are feeble. The central nervous system is highly oriented. The corpora striata, anterior commissure, and pedunculi cerebri are relatively large; but the pallium and corpus callosum are represented by thin white strips of tissue, mostly smooth, and containing little grey matter. In domestic fowls, and in some birds of prey, there is a slight depression upon the surface of the pallium marking the position of the Sylvian fissure of the primate brain. The organ which supervises and regulates the many voluntary neuro-muscular activities of a bird is the cerebellar "worm"; the appendages are not developed. In sagittal section the "worm" shows an *arbor vitae*, produced by repeated transverse folding of the whole organ (F. Hans Gadow).

(*c*) Avian life is highly emotional. The young flier meets "thrills and shakes" that would nerve-shock any but the staidest human. Walking, hopping, running, diving, swimming, and even dancing are all within the scope of avian activities. As regards the higher mental attributes, birds in common with many vertebrates have "call notes." The avian notes are produced at the two extremities of the palato-tracheal tract. They vary from the in-drawn cluck of the broody hen to the operatic melody of the educated bullfinch. They represent the primitive wish of sentient beings to express their ideas to each other.* Other phases of economic life, sanitation, education of their young, the use of tools and their making, and even the elements of surgery, have been shown by competent observers to have a place in a bird's life. Again, in the pugnacity developed by land-greed, the so-called "territorial aggressiveness" of some birds; in the right of the strong to eject and slay their weaker kinfolk and to occupy the latter's derelict homes, we perhaps have glimpses of *Kultur* that a cerebellar "worm," untrammelled and supreme, can achieve. Finally, as already stated, musical sounds are much in favour with birds; yet the "worm" has a far closer relationship to the end fibres of the optic lobes than it has with the nucleus of Deiters's or other otic ganglion, and we must expect optic impressions to exert greater influence upon avian emotions than do auditory ones. Birds are always strongly attracted by light reflex. Even if we exclude the "Jackdaw of Rheims" as unreliable, there are daily incidents in a bird's life that can only be explained thus. Even logic cannot be entirely withdrawn from the purview of avian mentality so long as a caged inmate by means of a suitable apparatus supplies itself with drinking water by drawing a bucketful—and an inference at the same time.

The Rôle of the Cerebellum in Dasypods and in Other Mammals.

The locomotory apparatus of birds differs essentially from that of mammals. A bird's movements are mainly effected by *simultaneous* motions in paired limbs (for example, flying, hopping, swimming, diving, etc.), and, furthermore, these movements are strictly limited in range and direction by bony outgrowths. Mammalian and, indeed, quadrupedal locomotion generally is effected by the *alternate* motions of paired limbs. Again, owing to the polarity of a highly oriented linkage of spinal metameres, the supervision and direction of a bird's actions by a centrally situated association area became feasible, and is consequently adopted. Mammals, mankind especially, perhaps owe their supremacy in the animal world to the fact that the mobility of peripheral limb-joints, particularly the *manus*, warrants the doing of delicate operations otherwise impossible. A less oriented central nervous system presumably requires a less centralized cerebellum. Hence the gradual evolution of the appendages.

(*a*) The armadillos are a survival of a bygone age when armour-skeletons were fashionable. The harmless, well-protected creatures are found in South America. The genealogical tree of even a "middle class" dasypod may well date back to the Pleistocene era. If so, animals then lived whose activities were dominated by a cerebellar complex, for, although the latter organ is well represented, as are also the olfactory lobes, the pallium is almost smooth, and the corpus callosum, joining the two lateral halves, is barely observable. In the broad-banded armadillo, three slight depressions on either side of the pallium foreshadow the chief fissures of the primatal brain. These anatomical details suggest that dasypods, like birds, are still dominated as regards their voluntary activities by the cerebellum.

(*b*) As regards their daily life, the armadillos (divided by naturalists into several species) have little to interest us. They are burrowing animals, and live mainly upon roots, decayed fruit, and carrion. They can quickly form a burrow in suitable soil, with their strongly-clawed forepaws and their long snouts. Some have been known to burrow into a recently formed grave. When hunted for their flesh in the open they can move rapidly upon the tips of their claws. When caught, some species roll themselves into a ball; but none seemingly show fight. Their eyesight and sense of smell are presumably good.

A Cerebellar Régime (?) in Childhood and Adolescence.

The evidence attainable from the biology of birds and dasypods suggests that the cerebellum (specially the *vermis*) is capable of supervising the voluntary activities of a neuro-muscular system up to a "point." The question we shall now consider is the effect of this doctrine on the brain-development and education of a child. We have already learnt that each of us during ontological development passes through a phase of automatic (involuntary) life ere we become intuitively volitional; and that these two stages of "life's highway" are fairly well defined in duration by—for the most part—an improved functional efficiency in certain sense organs being observable, on the one hand, and by a more rapid reflex *arcal* response on the other. These heritable conditions ostensibly dominate childhood until the third year. Subsequently other expressive reactions to environmental change are noticeable in the child's mentality, reactions which cannot be ascribed to any purely intuitive phase, yet fit in well with the functions of a well-endowed cerebellum, such as we suppose a budding "homo sapiens" to be likely to possess. Among these emotional reactions the "call notes" take a prominent place; for in them we may perceive the inchoation of articulate speech, the ruling emotion of democratic governance. The only call note the broody hen makes is an indrawn "cluck," produced probably by the tongue pressed against the opening in the split palate. Some Red Indians, Hottentots, and others, mainly dolichocephalic aborigines, still have their indrawn "clicks" in their spoken languages. European children when they begin to talk often utter words with an intake of the breath. Perhaps they revive an inherited memory of some early ancestor, who used this form of utterance. Many cases of asphyxiation among tribal chieftains as a direct result of rhetorical vehemence at meal time doubtless contributed to check this custom. Again, the musical "call notes" of birds remind us of the significance of the words of the ancient preacher: "Curse not the rich in thy bedchamber, for a bird of the air shall carry the voice, and that which hath wings shall tell of the matter" (Eccles. x. 20). Specially is it the case if "that which hath wings" is a member of the R.A.F. upon scouting duty. Music is associated, as we know, with the soaring lark "that at heaven's gate sings," yet it has been left to an inquiring correspondent of a daily paper, after recounting the brilliant exploits of the R.F.C. men in the relatively early days of the war, to remark "that many of them are men

* The following references deal with statements successively made in the present paragraph. "Clucks" are fully discussed in *Lancet*, 1901, i, p. 50; also in the *Journ. Anat. and Phys.*, same year. Many birds show an elementary knowledge of sanitation by the removal of the fledgling's excreta from the nest. Major Hollis writes me from the near East that he has seen a kite teaching its young how to fly. The parent enticed its young from the nest on the roof to the edge by walking backwards the while with a choice morsel in its beak. When they arrived at the edge it fluttered just beyond their reach until, overbalancing, they had flown to the ground. Mr. C. J. Carroll (*Irish Naturalist*, May, 1916) tells how ravens teach their young by a regular course of training to ward off the attacks of peregrines. Mr. Owen (*British Birds*, July, 1916) records how carefully sparrow-hawks keep their nests sanitary while the chicks are very young. Miss N. F. Layard (Linnean Society, April 19th, 1917) offers evidence that the African grey parrot is not only a tool-user but a tool-maker as well. J. H. Owen (*British Birds*, January, 1917), in a paper "On the breeding habits of the red-backed shrike," noticed that when a gluttonous youngster had swallowed a larger "cast" than it could conveniently eject, and was in danger of choking, the parent thrust its beak adown the little one's throat, and so removed the offending morsel.

of great musical talent." Maybe the thrill of the lofty expanse appeals to the emotions of the musician more strongly than it does to others. And hence that predilection.

In childhood the fear of pain stimulates the dormant cerebellar cortex. A healthy baby cares little for a tumble when he begins to toddle. The growing child learns the need of balancing himself. Falls are hurtful, and many may be avoided with care. Other ancient parts of our brains are the basal ganglia in front of the cerebellum. By the middle peduncles the great receptacles of outside news can send the same at once to the cerebellum, there to be rearranged and sifted by suitable cortical synapses before its return to lower distributing centres for appropriate responsive movements; some peripheral cutaneous impulses pass directly to the cerebellum, a shorter route. Maybe habits of life and conduct mainly depend upon systems of interrelated synapses in the higher centres, which act as centres of resistance to nervous impulse. By distributing selective impulses, and by linking up one impression with another, these systems form habits.[6] The impulsive, not to say "thoughtless," acts of childhood are in that case the direct result of a cerebellar régime uncontrolled by the higher cerebral centres.

Mainly about Noses.

The neopallium seems to have grown around the olfactory lobes in the early vertebrate types much as the cerebellum grew around the central endings of other sensory nerves, and the correlation of cerebral development with the growth of the adrenalin cortex in human ontology may be accepted as consistent with known facts.[7] Man's progenitors with "herd instincts" and omnivorous appetites were probably among the first mammals to acquire this evolutionary arrangement for the closer co-operation and supervision of sensory impulses forwarded from the lower (sympathetic and other) centres. Palaeontology meanwhile offers us no reliable data in support of the above theory, and we must rely upon the biological facts which natural history supplies in its aid. The reason for this need is not far to seek. The oldest human fossil skull is presumably some thousands of millennia more modern than the Eocene epoch wherein the pallial changes happened. The recent discovery in Queensland of a fossil skull[8] definitely shows that man's brain first acquired its human status while his features still retained much of the grossness of the ape's. Owen divided the ape family into "three very natural groups," according to the shape of their noses. The seasonal variations in the duration of daylight over much of the land owing to the inclination of the earth's axis of rotation to the plane of the ecliptic must have greatly increased the functional value of the eoanthropic nose when artificial luminants were scarce and expensive. Ape-like men trusted to their noses and ears at night, when much of life's work was done. Night prowling begets stealthy movements and craftiness, in which the cat family delights. The need for slimness in those far-off times was urgent, and that very urgency doubtless stimulated the adrenalin development of man's neopallium.

The Reflective Phase and the Growth of Fancy.

Andrew Lang once wrote: "Curiosity and credulity are the characteristics of the savage intellect." They are also the peculiar attributes of childhood.

Hitherto we have attempted—with what success it is for the reader to decide—to give a brief survey of man's phylogenetic evolution by following out, so far as facts permit us to do so, the main outlines of biogenic evolution generally and noticing any striking similarity between them all. When an inquirer draws nigh unto the stupendous brains of mankind generically, and of the civilized races in particular, he must tread with caution lest he rouse "the dogs of war" and they "cry havoc" much to his discomfort! It is all very well to repeat the wise saw of the Spartan ephor, Chilon. "Know thyself," indeed; why, no one has ever had that experience. Burns was nearer the truth when he wrote the tag, "To see oursels as others see us." His great head has solved the problem. None of us really "know ourselves"; if we want a clear knowledge of ourselves we must needs ask our public to help us. Apologizing for this long although important digression, we shall now get on with the work before us.

Any theory respecting the gradual evolution of man's higher mentality will naturally tread upon the toes of a good many experts in these branches of science. I know my own limitations, and wish to offer the following suggestions as a provisional theory, leaving it to others, if they think fit, to elaborate it afterwards.

We have already learnt from the biology of the lower animals (including the birds) that the first depressions to appear upon the pallium are the depressions representing by their position the great fissures of the human brain. We also know that the Sylvian fissure was the earliest to appear; and that at the bottom of that fissure is Broca's convolution, which is specially concerned with speech. The next most important fissure is undoubtedly the Rolandic. Hedging this fissure are two important gyri—the ascending frontal and the ascending parietal. The functions of these gyri have been mapped out by both physiologists and pathologists. They seemingly co-ordinate and supervise the afferent impulses already retained in the great basal ganglia, after these impulses have run the gauntlet maybe of the linked synapses in the cerebellar cortex. By so doing their relations with such impulses are far closer than they otherwise would be. For instance, the fifth nerve, as it rises from the brain, is probably the only nerve of taste (Starling). While the nasopharyngeal mucosa is associated with word utterance, the ascending root of the fifth is placed in the pons between the roots of the auditory and facial nerves, three ganglia largely concerned with the production and apprehension of spoken words. Again, the olfactory lobe by two roots is closely connected with the gyrus fornicatus and the gyrus hippocampi. The point to be emphasized is not entirely anatomical. Speech, which depends upon voice sounds, requires at least two individuals for its comprehension, the speaker and the listener. Phylogeny has presumably found vocal inflexions an easy task, and many vertebrates are able to make known their urgent needs by voice sounds. Few, however, have elaborated a sufficiency of different sounds expressive of different ideas to name such a group of sounds a language.

The orientation of a series of linked metameres before alluded to gave the frontal (polar) end supreme authority over all the hinder ganglia. By implication the fore end was also the latest neuronic complex to be evolved, and man's neopallium was structurally completed from behind forwards like other parts of the system. The frontal lobes then would be the last part of the brain to acquire complete functional efficiency. War-time observations upon lesions of the prefrontal lobes suggest that young soldiers make little (if any) use of these comparatively recent evolutional zones, and that in some cases men may feel "undue happiness" when some injury has placed the lobes permanently out of action.[9] On the other hand, we have anatomical evidence that the older (from an evolutionary standpoint) lobes—namely, the occipito-temporo-parietal—are well developed in men of great intellect.[10] European infants are born with posterior dolichocephaly, and their occiputs are relatively smaller than the rest of their skulls to suit the needs of bony outlet of the maternal pelvis. A secretion from the adrenalin cortex subsequently builds up the brain of a healthy child in accord with its heritable ontogenetic development. Maybe during this critical period of developmental growth the older cortical neurons of the cerebellum, with their many interrelated synapses, at times become unstable, and revive the fears and fancies of some bygone ancestor.* Small-headed peoples with posterior dolichocephaly (such as Papuans, Polynesians, Australians, and many negro tribes) are the most uncultured races of the present-day. (*a*) Their languages, unwritten, consist of primitive vocal sounds; and (*b*) they have a widespread belief in the presence of little malignant demons.[11] As regards (*a*), although some cultured races of eolithic man may have decorated their caves with pictorial devices, an art subsequently lost at a later epoch, yet a permanent record of ideas by letter symbols was delayed for many millennia, doubtless owing to anatomical and psychological difficulties in attuning fingers to respond with precision to delicate psychomotor impulses. The oldest book extant comes from Egypt. Its author, Pathotep, broaches the perennial problem, the social position of woman. In his address

* So far as Scotsmen are concerned, the Report of the Registrar-General for Scotland, 1895, supports the view of the instability of the higher nerve centres throughout the period of adolescence.

to husbands he wrote: "Fill your wife's stomach and clothe her back, and her love shall reward you, as a well-tilled estate rewards the cultivator." Even in those far-off days, six thousand years ago, woman looms large on the family horizon. While the sex of the little demons that harass the lives of the small-headed peoples is doubtful, the deities presiding over the fortunes of the bigger-headed races of the ancient Eastern world were as a rule both bisexual and anthropomorphous. The male element, Khëen-yang, of China and India, originating in a solar myth, ascribed to a god both generative and destructive powers; the recurrent dryness of summer often destroying the springtide fertility of the moist earth.[12] Yet it is around the female element that the main interest centres. Throughout the Eastern world for many centuries the goddess of love and fertility, Kwan Yin, the "Turanian Venus" of China and Japan, and her child, Zen-Zai, embodied the solar nymphean myth above mentioned. The goddess has been identified at different times and by various nations as the Assyrian Semiramis, Astarte, and Ishtar, goddess of love and chase, the Persian Anaitis, and later in Europe as Aphrodite, Artemis, Juno, and Venus. She was subsequently associated with the cult of the Virgin Mary.

The Birth of Altruism and the Development of Conscience, and Scapegoats.

Love of offspring and preservation of racial characters are the bases upon which the attractive presentment of a spirit of universal altruism is built. Among the lower animals—and we must search the depths ere we exploit the shallows—parental love lasts so long as the offspring are unable to fend for themselves. When that event takes place the loving guardianship of the parent disappears and is replaced by callous indifference. The change shows the shallowness of altruism among the lower animals. Man is not exempt. The black Negro and the white Arab and Kabyle (specially when the last two are mixed with negro blood) are apparently incapable of realizing even parental love. While our troops were engaged in raiding hostile Arab camps in Mesopotamia, it was a common event for nursing mothers to throw their babies violently away among the sand dunes, and so to free themselves from an incumbrance to rapid flight. Many millennia ago in the Far East the brachycephalic races there dwelling found that this callous conduct did not "pay." Certain slim and sly individuals, calling themselves "prophets," "soothsayers," or what not, professed to exorcise devils, heal the sick, and act as medical missioners to the community generally. These quacks, with the help of their kings and other great men, instituted an annual spring festival, the Socaea, lasting five days. At this feast, which was characterized in ancient Assyria by extreme lewdness and intemperance, a King-God, the "Zoganes," was elected for the five days. During his short reign he was seemingly allowed the run of the real king's harem, from which he selected a queen. At the end of his term of office he was either hung, crucified, or burnt on a funeral pyre. By so doing he carried away with him the sins of his people, so that they started a fresh year freed from sins and innocent of crime. The mythical founder of the Babylonian empire, Ninus, married Semiramis, the daughter of a fish goddess, and made her his empress. Semiramis, not satisfied with this dignity, persuaded Ninus to be the "Zoganes" at the next Socaea. He was therefore immolated on a funeral pyre so that his beautiful consort might be relieved for awhile from the burden of her many sins. Such was the scapegoat.

The Futurist Superman and his Education.

Few of us activate a tithe of our cortical brain cells during an average lifetime. Large tracts of association territory, such as the right cerebral hemispheres, are rendered useless by defective education.[13] Maybe the cortical areas in the "comparatively recent" evolutional zones in the prefrontal lobes are still functionally inefficient, and are therefore rarely, if ever, called into activity. Wartime surgery shows that we only use a third of the fibres in a peripheral nerve trunk to carry on our life's work; in other words, we fail to use to its full extent the mechanism at our disposal to obtain a fuller and more complete knowledge of our surroundings than is otherwise possible. If the mentality of the coming race is to be developed, and their outlook upon the world broadened, teachers must seek to stimulate some of these dormant brain cells into healthy activity, and meanwhile they might teach the young the cult of ambidexterity!

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RESTORATION OF FUNCTION AFTER PENETRATING GUNSHOT WOUNDS OF THE KNEE-JOINT.

(Preliminary Communication.)

BY

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With Note by

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THOSE of us who are on service abroad have little opportunity of studying the advance in military orthopaedics which is becoming such an important element of our organization. In the vast majority of hospitals in France beds cannot be spared for retention of cases which have arrived at the stage where restorative measures are to be adopted. This, from a surgical point of view, is most unsatisfactory, but we must bow to the inevitable.

There are certain cases where, at any rate, the commencement of restitution of function is advisable before evacuation to England, for reasons which I shall give. These are penetrating wounds of joints, particularly knee-joints.

It is common knowledge how successful are the immediate results of the present-day operative methods carried out at clearing stations and base hospitals. We have been astounded by the way in which the knee recovers from the insults it has been subjected to, and we have learned to look upon the synovial membrane of a joint as being almost as good a friend as the peritoneum. To my mind, however, there is still something wanting.

It was my habit up till the end of last year to send cases which had healed by first intention after removal of foreign bodies, etc., from the knee-joint, to England about the tenth day after operation, when all doubt as to the presence of sepsis had dispersed. My custom was to ascertain on the day of departure if there was any movement of the knee-joint present, and to send Medical Research correspondence cards with the patients, for information of progress, especially of ultimate mobility. The information was, as a rule, forthcoming, but generally brought disappointment, for, according to these reports, restoration of function was not commensurate with the immediate success of the operation.

Several factors may account for this.

1. The patient may not arrive, or arrive too late, at a home hospital where orthopaedic measures are understood and practised. It would appear that each day's delay before the carrying out of efficient movements, etc., will add very considerably to the time of ultimate recovery.

2. The psychological factor must not be ignored. It is no evidence of poor morale, but a natural consequence that a man who has become accustomed to the comforts of a home hospital, perhaps near his native city, will not be over enthusiastic to get back to the trenches, probably to a new unit. His will to recover or not to recover, when

complete recovery means return to duty overseas, will have a large bearing on the completeness or otherwise of restoration of function. Want of co-operation is a severe hindrance in orthopaedic proceedings.

3. The personal interest of the surgeon who performs the operation is lacking when the patient is transferred. The overworked members of the profession in England can hardly be expected to put such vigour into the after-treatment of cases which are to them second, third, or fourth hand. Moreover, fear of a flare-up—more likely, I believe, to occur in late cases where fibrous adhesions in the joint have to be broken down—may deter some of those at home from actively interfering.

Restoration of function after "civil" operations on knee-joints (removal of cartilages, wiring of the patella, etc.) are nearly always accompanied by a full range of mobility. The three factors above mentioned may account for the lack of a corresponding result in those cases of gunshot wounds where no septic complications developed, or where there was no gross lesion of the articular surfaces. It might be suggested that organizing blood effusion is more likely after gunshot wounds, but since it is the universal practice to wash out the knee-joint when performing the operation, this objection does not hold.

To help to obviate the three above deterrent factors, I have come to the conclusion that early movements should be commenced before evacuation to England, beginning, as a rule, about the seventh day after operation. The movements are continued by easy steps until there is a range through at least 90 degrees. This range I make the necessary qualification for evacuation to England, and my patients have this explained to them very clearly, emphasis being laid on the fact that the sooner their knees can be bent to a right angle the sooner they will be sent home. As a rule, this range is obtained in seven to ten days—occasionally, but not often, longer.

I have devised an arrangement by which movements of the knee-joints may be carried out with the minimum amount of pain to the patient and trouble to the operator. The results achieved with it are most encouraging, and have justified the time spent in construction, and the carrying out of manipulation. The essential parts of the apparatus are as follows (Fig. 1):

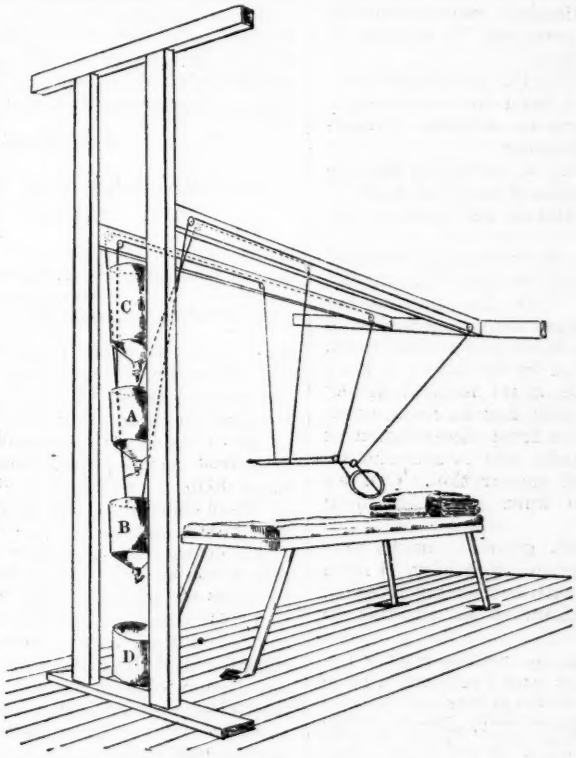

FIG. 1.—Diagram to show general arrangement of system. The two limbs of the splint are counterbalanced against the sand reservoirs A and B. These travel up or down according to the amount of sand contained. C is a sand cistern and D a waste; these are fixed.

1. *A Hinged Thomas Knee Splint.*—These hinges are inserted into an ordinary Thomas splint provided with extra stout side bars. A locking device on the hinges is necessary; it is controlled either by a bolt and thumb-screw, or by locking pins inserted through holes on large flat discs welded on to the side bars. This splint is slung, but not from its extreme upper and lower ends, as is the usual practice. The cords sustaining the weight of the upper part are fixed immediately above the hinges, while the lower part is supported by cords attached to the bars about 15 in. below the hinges. Tent "runners" are used on the suspending cords for adjustments.

2. *Two Overhead Rigid Bars* (comparable to a double Balkan bar, differing, however, in that the bars should be 5 ft. above the level of the bed; they should extend beyond the head and foot of it, and have a considerable inclination towards the foot end). These bars are 12 in. apart, and lie over the affected limb; they carry a system of pulleys, over which run cords suspending at one end part of the splint, at the other counterbalancing sand reservoirs.

3. *Sand Reservoirs.*—There are four of these (Fig. 1). They were made from conical topped oil drums, the three upper ones are fixed inverted to allow easy escape of sand. The reservoir A counterpoises the lower part of the splint, and B the upper. These reservoirs will have an up and down excursion according to the variation in position of the parts of the splint they counterbalance. C is a sand cistern, and is fixed, while D receives waste sand from B. Into the necks of the drums are fitted corks, perforated by three-eighths inch glass tubing, connected on to which is a short length of rubber tubing. Sand will flow through these tubes, and can be controlled by paper clips, which by gripping a part of the circumference of the rubber tube will diminish the rate of flow, or will stop it altogether by complete compression.

Method of Procedure.

About the tenth day, or earlier in favourable cases, the leg to be fixed is put into the hinged splint, the joints of which have been locked, making the whole rigid. The leg extensions are tied to the crossbar of the splint in the ordinary way, and the foot suspended by gauze glued to the sole, from a metal frame. Enough sand is put into the reservoirs A and B to float the splint comfortably, and when the hinge locks are released to suspend the two limbs of the splint in their relative positions. The tap of the reservoir A is now released, and the sand runs into B, the result being that slowly the splint develops an angle and the knee bends.

During the first two or three days the sand is allowed to run very slowly and no great range of movement should be attempted, about 45 degrees being enough. After this the patient will have gained confidence, will realize the object aimed at, and will co-operate. The time taken is about half an hour; after this a return to the original position is obtained by allowing sand from B to run into the waste receiver D; thus the upper part of the splint descends; the lower part is raised by running sand from the cistern C into A. When a comfortable position and height of the limb is gained, the hinges are locked.

It is advisable, in refractory cases, where progress is slow, to lock the hinge at the limit position of flexion obtained at the end of the sitting. It may be so left for a few hours, and in this way it may be fixed at a slightly smaller angle each day.

As a rule, at the end of a week the patient is able, and often anxious, to begin *active* movements. These are to be encouraged, and if he can be sent home with a range of active movement through a right angle, and without a splint, he is unlikely ever to stiffen up again. At this stage walking appears to be unattended with harmful results. It is of great advantage to carry out a course of massage, faradism, and movements (active, passive, and resisted) when flexion through 90 degrees has been obtained, thereby hastening the time of full recovery.

When the man is evacuated to England it is clearly stated on his field card what range of movement was obtained when he left France, and an appeal is made for progressive treatment. This is, no doubt, superfluous in many cases, but not in all, for quite recently I have received reports in the following tone: "No sepsis, transferred to back splint, moved occasionally," and "Put on back splint, knee ankylosed." Some patients have written to me that they have had no

movements carried out, and that their knees have become stiff.

Such were some of the ultimate results of cases which had healed by first intention, showed no signs of subsequent sepsis, and should have obtained good movable joints, before I instituted my present method of procedure. Of seven cases which healed by primary union after arthrotomy in October, 1917, the best results I have knowledge of are (1) 25 degrees of movement, (2) 10 to 15 degrees, (3) four-fifths of full mobility. The last is the only one of these seven who, apparently, has been returned to his dépôt for duty.

Advantages Claimed for this Procedure.

1. The movements, being so insidious, are nearly painless.
2. Painless movements do not set up reflex spasm.
3. Movements can be commenced early and prevent fixation due to intra-articular or extra-articular fibrosis.
4. Elimination of the danger of acute flare-up, as may happen when forcible movements are carried out under anaesthesia.
5. Where masseuses are not available, a nurse or intelligent orderly may carry out the treatment. A number of cases may be treated at the same time.
6. The patients are informed that the qualification for England is that their knees shall bend to a right angle. This encourages their best endeavours—a factor of incalculable value in all orthopaedic measures.
7. The apparatus is cheap and can be set up by any one mechanically inclined. The necessary material may be collected in almost any camp hospital on the lines of communication or at the base.

I have been tempted to adopt the principles outlined above to prevent stiffness of knees occurring during the treatment of fractured femurs. With the present-day methods we can, as a rule, obtain good alignment and little or no shortening. Fractures of the lower and middle third, however, are nearly always followed by limitation of knee movement, especially where the usual method of leg extension is adopted. The stiffness has in most cases an extra-articular source; it results from cicatrization of the traumatic and operation wounds, and is accentuated in cases where there is prolonged suppuration. Can we not prevent this stiffness of the knee from becoming established?

When acute sepsis has subsided, good alignment procured, and the fractured ends are becoming "sticky," I have tried this method of knee flexion with encouraging results. Firm support at the seat of fracture in addition to extension is imperative.

Example.—Pte. C., comminuted fracture of lower third of left femur, December 5th, 1917. Two days later I removed a large piece of high explosive, one loose fragment of bone, and applied bipp to the exposed muscles. On January 22nd, 1918, the bones were "sticky" and movements commenced. He was sent to England early in March with a range of movement from complete extension to considerably less than a right angle.

I am not equipped with a sufficient number of results to be able to state dogmatically that this method is advisable. However, the few cases I have treated encourage me to further trials.

It appears that early institution of movement after penetrating gunshot wounds of the knee may determine whether or not the wounded man will become fit again for military service. It seems justifiable to postpone evacuation to England for a week or two in order to adopt measures which yield prospects of at length getting men back to duty, or at any rate making them more fit for subsequent civil employment.

Since writing the above I have learnt that Willems has for some time advocated mobilization of knee-joints immediately after operation. He commences active movements from the very first, and claims an early return of full-range mobility in most cases, even where there is considerable bone injury. Not uncommonly there is an effusion of blood into the joint which checks progress; however, when this is drawn off, movements make good headway, and walking is usually possible in the second or third week. He is not deterred from carrying out active movements even in the presence of suppuration, holding that the movements express pus from the recesses of the joint through the incisions made for drainage.

Such treatment is somewhat revolutionary, but, after all, many of our pre-war ideas have had to undergo an upheaval equally dramatic.

Note by COLONEL FULLERTON, C.M.G., A.M.S.

The difficulties encountered in obtaining a freely moveable joint in wounds of the knee and in fractures of the lower third of the thigh are notorious. Most massage operators are inclined to be too brusque in their endeavours to obtain joint movement.

Major Everidge has devised a plan by means of which a graduated range of movement may be calculated with almost mathematical precision. The insidious coaxing into function accomplished by his method prevents the painful spasm and the lighting up of infection which is so liable to accompany unmeasured attempts by even the gentlest manual manipulation. I have watched most of his cases with interest during the earliest periods of their convalescence, and I have been struck by the absence of febrile reaction and pain.

The method is scientific, and has proved successful in the cases I have been able to follow with him.

It is to be hoped that surgeons at home who see cases of injured knee-joint and fractured lower third of the femur will be encouraged by Major Everidge's success to persevere with this or similar methods, to avoid what has hitherto been somewhat of a reproach in war surgery.

SUGGESTIONS FOR THE TREATMENT OF SEPTIC WOUNDS.

BY

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THE following paper deals with the impressions derived from an analysis of a thousand cases which passed through the writer's hands at an auxiliary hospital. These cases were taken in rotation and not by selection. They were all in a more or less convalescent stage, having been treated at various hospitals, so that in the majority of cases many months had elapsed from the commencement of their illness to the time of their admission to the auxiliary hospital.

There was of necessity some finality in their symptoms as shown in a depreciation of their potential capacity as soldiers. The symptoms, too, were more or less dissipated and attenuated, and in this sense possessed a value of their own as enabling them to be more easily classified and their importance appreciated. The constant association of neurasthenia with other diseases, such as frost-bite, rheumatism, wounds, gas poisoning, tended to show how the ordinary symptoms of these diseases could be materially modified, and that chiefly in the direction of persistence and exaggeration.

The majority of cases of neurasthenia were sent as cases of "shell shock," but however much the symptoms may have approximated to those of shock in the initial stages, at the time they were admitted into our hospital they were undoubtedly neurasthenic, representing a condition of cerebral and spinal exhaustion. For instance, one case had a history of unconsciousness for some days following a bursting shell; another had a history of prolonged mental and physical strain in the trenches, yet in both these cases the symptoms were identical. In every case noted as neurasthenia there was some gross manifestation of the disease, though the cases of a milder degree not noted must have been manifold. Some symptoms which are generally regarded as casual or ordinary in the neurasthenia, traumatic or otherwise, met with in civil practice become dominant features in these shell-shock cases. Such, for instance, are tachycardia, stammering, tremors, which are far more in evidence in these cases.

In the 1,000 cases analysed, 75 were neurasthenic, while 505 were the subjects of wounds; of the latter, 249 suffered from disability owing to pain, limited movements, and deformity. Of these latter, all complicated with fracture were excluded. The disability was entirely due to scar defects. These scars were distinguished by their multiplicity in individual cases and by the large number that were adherent, irregular, and infiltrated. There was a marked contrast between the scars in these cases and the scars met with in the South African war, the proportion of cases producing disability being much larger. This

was not due to any fault in the treatment at the front, where, as every one knows, the arrangements are perfect, and the best surgical skill is everywhere available. It was due to the very early infection of these wounds, and the impossibility of applying appropriate treatment at the early stage.

The kinds of disability are classified according to their cause, pain, limited movements, and deformity. Pain may be divided in five categories:

1. Paroxysmal pains of neuralgia. These are distinct paroxysms, with intervals of freedom from pain. These pains are independent of movement.
2. Neuritis pains. These are more continuous, and there is tenderness along the course of the nerves. They generally occur in wounds infected at the outset or represent a transition stage from a traumatic neuralgia. Most of the head injuries, I consider, belong to this category.
3. Pain at the site of wound and caused by movement. These cases are generally associated with limitation of movement. The largest number of cases belong to this category.
4. Deformities occurring as the result of adherent and contracting scars. For instance, talipes equinus following on a contracting scar of the calf; the fixed flexure of joints from scars in their vicinity. The pain in these cases comes on after exercise.
5. Referred pains. These are referred to some remote part of the body, and have "apparently" no connexion with existing scars. In these cases there is, as a rule, a multiplicity of scars or a large area of scar tissue. There is invariably neurasthenia.

Example.—Sergt. V., West Riding Regiment. He presented five scars: Left arm and forearm, right arm and forearm, and over right eyebrow. He suffered from no inconvenience from these scars, but complained of great pain at a point a little below and to the inner side of the angle of left scapula. He was markedly neurasthenic, suffering from insomnia, tremor, and vertigo, etc.

The etiology of these cases would seem to be that when there is peripheral irritation from many sources in a neurasthenic patient a hypersensitive state of nerve centres is produced by which impressions are intensified and widely referred.

The following case is interesting, though difficult to classify. The history is incomplete, as I was only able to get a glimpse of it at a travelling board. It was a case of gunshot wound on the back of the left wrist. There was a large, irregular, non-adherent scar. There was no evidence of injury to the joint, bones, or extensor tendons. The muscles of the hand and forearm were wasted. The history that he gave was that the illness was a long one and that the loss of power was gradual and progressive. The hand was in a condition of complete drop-wrist. It occurred to me that this might be a case of neuritis migrans.

From a perusal of the above one cannot help noticing the large number of intractable neuralgias present. Three factors would seem to enter into the causation of this condition:

(*a*) The large number of wounds infected at the outset originating a septic neuritis.
(*b*) The presence of the neurasthenic state in which an unduly sensitized mental register modified the results so that ordinary impressions were intensified.
(*c*) The large number of adherent scars. This probably was the most potent factor.

As a result of much work and research at the front it has been conclusively proved that, owing to the condition of the soil, wounds are infected from the very first. It was also shown that modern germicides, on account of their low penetrating powers, are unable to reach the infected areas which lie in the lacunar spaces beneath and outside the wound itself.

As a result of these researches the physiological treatment of wounds by irrigation has largely superseded the older methods. This treatment, however, cannot be applied in the very earliest stages, when it is so necessary. The consequence is that gangrenous and septic processes have already begun in the wound before irrigation can be applied. This accounts for the large number of unhealthy and adherent cicatrices with their resulting disability. Whatever treatment, therefore, is adopted, it must be prompt, and it should aim at reaching in the very earliest stages these outlying infected areas, to reach which has taxed the efforts of our most skilful surgeons. It would seem that to throw around these infected areas a circle of bactericidal serum would most nearly approach the conditions required, and would best anticipate the treatment of irrigation which is to follow.

In a few emergency cases in South Africa, where prompt attention and immediate removal were required, I adopted the following somewhat crude but otherwise effective method:

I grasped the wound with the left hand well beneath its base, at the same time drawing it well forwards and making the thumb and fingers compress the tissues tightly. I then transfixed with a needle, entering the point immediately beneath the tips of thumb and fingers. In a similar manner I transfixed the tissues about an inch beyond each end of the wound, taking care to include the same depth of tissue. I then passed a rubber ligature round the wound beneath the needles. This was tightened to the desired extent and fixed by a clip. The points of the needles were protected by pieces of cork wrapped in sterilized gauze. It will be understood that the only idea in these cases was quick transport.

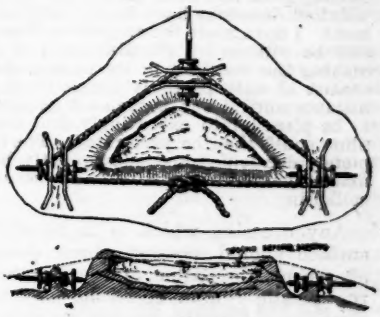
The knowledge of these cases suggested to me the instrument figured in the illustration. It was made by a local watchmaker of the only materials at hand and is necessarily somewhat crude, though the plan is quite correct and the larger scale serves to emphasize its main points. It can, however, be made on the smallest scale and adapted to the finest surgical needles.

FIG. 1.

It consists of two slender looped splints, a system of wormed needles with detachable points and nuts which travel on the needles. In this way the splints are made to approximate to each other and so compress the intervening tissues.

The manner of using it is sufficiently indicated by the illustration. It is practically the same as the description given above of my own method of treating cases in South Africa, with the exception that the splints are looped on to the needles and made to approach each other by the nuts. By transfixing the tissues in the manner suggested by me an immobility is obtained in the simplest, easiest, and quickest manner possible. The immobility is far more perfect than can be obtained by splints. There is no traction on any part of the area included within the needles. The edges of the wound are quite flaccid and tend to fall together.

In the compressed area the circulation is controlled and easily regulated. It is more equable, and protected from reflex vasomotor impressions. The physiological engorgement ensures a flooding of the basal areas with bactericidal serum and the infected interstices and lacunae are in this way reached. One effect of compressing either by splints or ligature a circumscribed area of tissue well outside the margins and base of a wound is to elevate, unfold, and flatten out both the basal and other parts of the wound itself. This is shown in Figs. 2 and 3.



FIGS. 2 and 3.

The base of a wound is thus rendered more superficial and more adaptable for any surgical toilet that may be necessary. The lymphatic spaces are opened out and easily reached. The same may be said of any wound diverticula which under ordinary circumstances would be difficult to reach. The wound in its new position is in a condition to be more effectively dealt with. Haemorrhage would be easily controlled, blood clots or sloughs removed, sinuses opened up, and infected areas disinfected. The elevation of the wound will depend upon the amount of outlying tissue engaged in the compressing agent. Wherever possible—and this will apply to the majority of cases—splint compression should be used, leaving the ligature to control the ends of the wound.

Where there are wound diverticula at the base some modification is required, and the ligature in these cases plays the most important rôle. This is shown in Fig. 4. Small portions of tissue are pinched up and transfixed, and retained by small splints. An encircling ligature is thrown round the wound, passing beneath the needles, and drawn tightly.

FIG. 4.

The direction and depth of any diverticula should be ascertained before transfixing, and a portion of tissue should be selected on the skin which corresponds to their terminations; a spot should be fixed upon well beyond these but in the same line. All diverticula should be treated in this manner.

In order to simplify the above description, the areas of skin transfixed will be spoken of as "standards." In mapping out an area of skin for the encircling ligature the following arrangement of "standards" should be observed. In case of irregularities at the base the "standards" are placed in relation to

wound diverticula in the manner above described. The disposition of other standards is immaterial, always providing that a wide circle is obtained, and that the distance between the wound margin and ligature is always greater than the deepest part of the wound.

To summarize what has been said, the elevation of a wound in this manner furnishes the following advantages:

It allows of a complete toilet. The bactericidal serum enhances the defensive properties of a wound, which, as is well known, are at a high state of development at the time of infection. During the progress of healing the perfect immobility of the compressed area, since all circumferential forces are inhibited at the line of constriction, gives the best condition possible for the building up of healthy scar tissue. The part inside the constricted area is free from any kind of traction, and the edges of the wound are quite flaccid and tend to fall together.

Of equal importance in the healing process is an avoidance of anything that would tend to depreciate the vitality of the growing cells. The practice of packing a wound with an unabsorbable dressing, such as sterilized gauze, is a familiar example of the continued disturbance of growing granulations wherever such a dressing is removed; not only is the proceeding exceedingly painful, but a layer of germinal tissue is taken away in the dressing to which it has adhered. This of course means delay, and what causes delay will eventually show in the final cicatrix. It is urged, too, that germicides in destroying bacteria must in some measure impair the vitality of the surrounding cells; it is considered improbable that the bacterial protoplasm should be killed outright, and that the protoplasm of the neighbouring cells should escape untouched.

Many years ago I invented a dressing from cancellous tissue of bone. This is deprived of fats, decalcified and bleached, and forms a soft white sponge-like tissue which adapts itself readily to the soft parts. It is both absorbent and absorbable. Though its utility has been circumscribed and limited, it is still a most serviceable dressing for chronic wounds, as I have had the opportunity of witnessing in this war. It fails in freely secreting wounds, as it does not provide sufficiently for drainage. I still think that if modified the matrix of bone tissue will ultimately form a basis for dressings. The need for a dressing which can be removed without disturbance of the granulations and without causing pain has been greatly felt in this war. Xylonite and celluloid dressings have been invented to meet this requirement. I have made the suggestion that cancellous tissue might still be utilized by a modification of the method adopted in making the dressing in its present form. Briefly, it would consist of only partially decalcifying the bone in the first instance until it was of such soft consistence as would enable it to be planed into exceedingly fine films. The face of these films could then be perforated. The films could then be completely decalcified and subsequently hardened in formalin to make them more adaptable and to secure the perforations from collapsing.

Any dressing which is to be applied to a granulating surface should possess three qualities: It should be absorbent, absorbable, and perforated. Absorbent, so that the plastic lymph could be held in its meshes for the nourishment of the ingrowing plasma cells. Absorbable, so that the dressing could yield, and be gradually replaced by the new tissue. Perforated, so that drainage could be obtained in the early stages, and the graft would thus be enabled to adhere to the granulations; otherwise the dressing is liquefied and prematurely absorbed. Healing by granulations should be "continuously progressive," and there should be no pauses in the process and no "retrograde movements," such as must always occur when a wound is treated with unabsorbable dressings.

For the development of perfect scar tissue one factor is essential—absolute rest in the healing zone. A healthy scar should be smooth, elastic, free from adhesions, and non-contractile. Contractility in a scar presupposes undue traction in the wound, against which it is an opposing force. It is the presence of this quality in a scar that is responsible for so many disabling conditions that remain after healing, such as deformities, intractable neuralgias, paralysis of nerves—such as ulnar paralysis where the symptoms are late in developing—chronic oedema, etc.

WEISSENBACH and BOUTTIER have reported to the Société de Biologie of Paris that the inflammation following penetrating wounds of the brain is usually due to the *Streptococcus pyogenes*, and that this is specially true of diffuse cerebro-meningeal inflammation arising at an early stage—that is to say, during the first two weeks after receipt of the wound.

A BED AND SOME APPLIANCES FOR GUNSHOT WOUNDS OF THE FEMUR AND BACK.

BY

MAURICE G. PEARSON, M.B., B.Sc.LOND., F.R.C.S.,
MAJOR SOUTH AFRICAN MEDICAL CORPS,
OFFICER IN CHARGE OF FEMUR WARDS, — BASE HOSPITAL, FRANCE.

THE accompanying illustrations show a special bed and some other apparatus found useful in the femur wards of a base hospital in France. Most of it has been in use for over a year, and all of it long enough to have proved its value.

The bed is intended primarily for gunshot wounds of the femur, but is also useful for any wound of the shoulder, back, or pelvis where turning the patient is difficult. It is an extension of the "sectional mattress" idea, with this addition—that not only the mattress, but the whole of that part of the bed that underlies the wound, can be removed altogether, giving unimpeded access either for dressing the wound, for radiography, or for ordinary nursing purposes, so that it is unnecessary to move the patient at all.

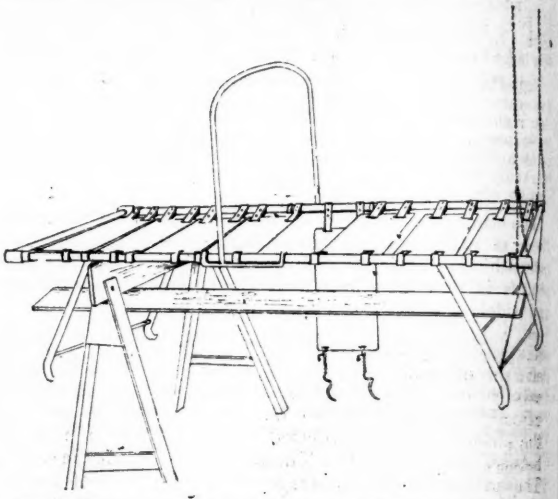


FIG. 1.—Femur bed stripped; one movable section with "quick-release" attachment let down as for dressings or radiography; the plank underneath is to support a dressing bowl.

It consists of an ordinary tubular frame army bedstead with the spring mattress removed and replaced by tight canvas slings, 11 in. wide, fastened by straps and buckles to one side-bar of the bedstead, and by metal hooks or a "quick-release" contrivance to the other.

Upon the tight slings lie the mattresses in three or more sections. For a femur case, one square "biscuit mattress" is under the patient's head and body, another under the lower part of the legs, and a small piece of mattress similar in shape and size to the canvas slings lies immediately under the wound and is the one that is removed, with its corresponding canvas, for dressing purposes.

As a matter of convenience the bed stands 36 in. high, the head of it supported on a wooden trestle, the foot either on a trestle or hung from the roof by chains, the length of which can be easily regulated to tilt the bed, if wished. In flimsily-floored huts the vibration is also much reduced by this means. A movable arch of round iron resting on the side-bars of the bed affords means for suspending the Thomas splint, or the pelvis of the patient if it is necessary to expose a large part of the back or buttock at one time. I would like to lay great stress on the value of the suspension of the ring of the Thomas splint: it prevents slipping of the ring, thus adding to the efficiency of the splint and the comfort of the patient.

Fig. 2 shows the other femur apparatus which is in ordinary use here. The patient arrives at the base hospital with his leg generally very well put up in a Thomas splint with strapping or glue extension applied below the knee. Our object is to retain the complete immobilization and extension of the thigh while securing the greatest possible freedom of the knee and ankle. Both of these objects can be attained without disturbing the adjustment made at the casualty clearing station, and without removing the Thomas splint there applied.

After the patient has had a good rest and been radiographed, Besley's or other callipers with weight and pulley extension in the line of the thigh are, as a routine procedure, applied to the femur just above the knee, and the points are inserted down to the bone, but not penetrating into it; any tendency to subsequent penetration is limited by placing a light check-bar between the handle-ends of the callipers; a subsidiary hinged splint, exactly similar to the

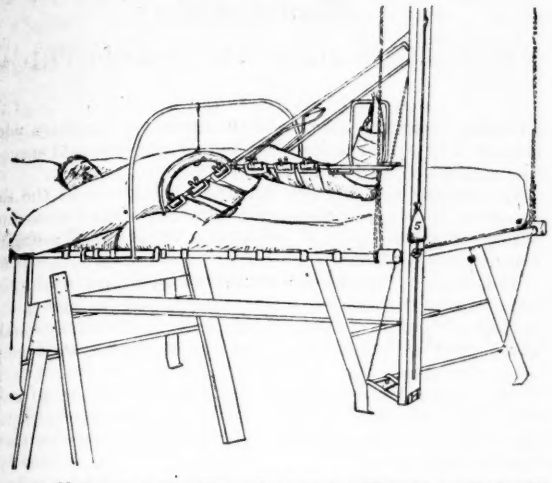


FIG. 2.—Femur bed with patient on it; Thomas's splint with large ring as sent down from the casualty clearing station, with knee-flexion piece added. Lower end of bed suspended by chains.

one used by Major Sinclair for elbow flexion, is attached to the Thomas by a thumb-screw at the level of the knee-joint, and the weight of the leg below the knee is transferred to this. The strapping or glue extension is then removed altogether. The femur thus has very direct and efficient extension through the callipers in its own long axis, while the leg below the knee has, and needs, no extension at all, and can be flexed as much as desired, the amount being regulated by a light chain and hooks between the foot of the Thomas and the subsidiary splint. The patient's foot is suspended from a foot-piece, as shown. The leg is bare below the knee and is massaged and moved daily.

In upper-fourth fractures, where wide abduction of the limb is necessary, two of the vertical suspension posts shown in the figure are attached to the foot of the bed and a third one bolted across the top of the other two, projecting as far as is necessary beyond the side of the bed.

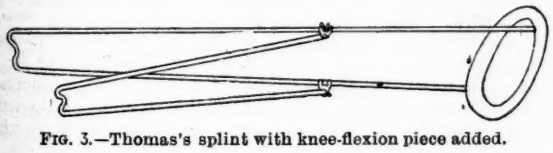


FIG. 3.—Thomas's splint with knee-flexion piece added.

The patient with the whole apparatus—bed, splint, extension post, weights, etc.—being compact and self-contained, can be carried as a whole without any difficulty in case of a fire alarm, or out into the garden if wished.

Measurements of both thighs are taken once a week by means of a sliding scale, such as shoemakers use, and any shortening is charted as regularly as the temperature. Very few have a centimetre of shortening. All have moveable knee-joints. Secondary haemorrhages are extremely rare.

With these beds one nurse can dress a case easily without assistance; the actual dressings of a ward of femur cases are much lighter than those of an average general surgical ward, though, of course, there still remains more fetching and carrying and washing.

I submit these particulars for publication in the hope that some of them may be useful or suggestive to others working in special femur hospitals. They have very greatly lightened the work and increased the efficiency of our wards.

I am greatly indebted to Captain Renwick, of the Army Ordnance Department, for valuable advice and assistance in making these appliances, all of which are now available through ordinary army sources or from the British Red Cross Society.

A CASE OF SEPTICAEMIC MENINGITIS, WITH RECOVERY.

BY JOHN DUNBAR, M.B.GLASG.,
LIEUTENANT R.A.M.C.

SINCE it is well known that cases of septicaemic meningitis are almost invariably fatal, and that cases of recovery are extremely doubtful, it is well to place on record a case in which recovery is not doubtful, and which shows an absence of certain signs and symptoms generally found in this condition.

S. S. was admitted to hospital on July 14th, 1917, suffering from a shrapnel wound of the right scapular region received seven days previously. The wound was superficial, very septic, and the spine of the scapula was exposed for three inches of its length. Except for a slight cough he was very comfortable.

Two days later, and for the following three days, he had a feeling of malaise. Rise of temperature was slight, and not of a septic character.

On the evening of July 19th he had an attack of syncope, following which he complained of severe pain in the eyes. Next morning he had a slight rigor—temperature 102.2° F., pulse 104, respirations 35—followed by pains in the calves and stiffness of the lower jaw. The jaw could be opened fairly widely; the tongue was coated with a brownish fur. As some of the signs and symptoms resembled those of tetanus, it was considered safer to treat the complication as that disease. The wound was in good condition.

He was very restless on the following day, and bilious vomiting preceded by nausea occurred. The pains in the legs were now severe, and the stiffness of the jaw was increased. In addition there was slight stiffness and tenderness of the neck, and slight headache. The temperature was 101.6° F., pulse 104. He continued in this condition until July 22nd, when lumbar puncture was performed, 20 c.cm. cerebro-spinal fluid withdrawn, and as it was still doubtful whether tetanus was the cause of the condition, 17 c.cm. antitetanic serum were injected. Although the cerebro-spinal fluid was clear, it was under slightly increased pressure.

The following organisms were found: Cocci, some of which were Gram-positive, others Gram-negative, but shaped like pneumococci. Small Gram-negative bacilli were also present. Culture gave a very abundant growth of the latter. No meningococci were found. Practically no polymorphonuclear leucocytes were present. The fluid contained no evidence of inflammatory reaction. The same organisms had been found in the pus from the wound.

The pain and stiffness in the back of the neck still continued on July 23rd, but the headache was now localized to the occipital region, and was severe. Kernig's sign was well marked, although previously it had been absent. Slight generalized twitchings were observed. He was given morphine ½ gr. that night, as he was very restless and his headache was very severe. There was no improvement in his condition on July 24th.

On July 25th 20 c.cm. cerebro-spinal fluid were withdrawn. It was still under slightly increased pressure, and on this occasion it was faintly opalescent. The same organisms were found as before, except that the bacilli were now very scanty. There was distinct evidence of meningitis, abundant polymorphonuclear leucocytes being present. Immediately after the lumbar puncture he became much brighter and the pains in head and neck were less severe. Slight congestion of the right side of the throat was present. No meningococci were found on bacteriological examination of the throat swab. He developed phlebitis of the left long saphenous vein.

Apart from a syncopal attack during the night of July 26th nothing of any importance was noted, except that his general condition was improving, until July 29th. On that day the pain and stiffness of the neck were absent, as was also Kernig's sign, and pain in the head was less severe. The phlebitis was still present. He continued in this condition until August 2nd, on which day his temperature was 101° F. Lumbar puncture was performed, 20 c.cm. cerebro-spinal fluid being withdrawn. The cocci and bacilli were still present, but were much scantier than on the previous occasion. Extremely few polymorphonuclear leucocytes were found. The fluid was practically clear.

As the headache was now much less severe, lumbar puncture was not performed until August 13th, when 10 c.cm. were withdrawn. Although practically under normal pressure the fluid contained a few organisms. Polymorphonuclear leucocytes were very scanty.

After August 13th the headaches were not constant. Lumbar puncture was again performed on August 28th. The fluid was under slightly increased pressure—greater than on previous occasions—but on bacteriological examination it was found to be sterile. The swelling and pain of the leg had disappeared, but the glands were still enlarged, although not painful. The patient was allowed up on August 31st. Oedema appeared in the leg on September 4th, and he was confined to bed until the swelling had disappeared.

On September 25th the following was noted as his condition: Weight increasing rapidly. Mentally bright. Slight frontal headaches of a very transient nature present. The eyes were examined by Major Fergus, R.A.M.C.(T.), who could find no

abnormality of the nerve structures. Heart and lungs normal. Apart from slightly increased knee-jerks, the nervous system presents nothing abnormal. Bowels normal. Wounds healing. Slight oedema of the left leg, and the long saphenous vein can be felt in Scarpa's triangle as a cord.

The features of interest in this case are that the patient has recovered; that the condition was discovered at a very early stage; that, in comparison with the number of organisms present in the cerebro-spinal fluid, marked signs and symptoms were absent; that headache was never severe except when localized to the occipital region; that emaciation and constipation were very marked; that the patient only vomited once, and that the emesis was not cerebral in type, but was preceded by a feeling of nausea; that convulsions and epileptiform attacks were absent throughout, except for the slight generalized twitchings on July 23rd; that Brudzinksi's sign was absent throughout; that there was hyperaesthesia of skin and muscles of the neck and calves during the inflammatory period, and that the temperature was never very high, the highest being 102.2° F. The pulse-rate in septicaemic meningitis is stated to be abnormally high compared with the temperature at the commencement of the disease. In this case the relationship between the pulse and the temperature was practically normal during the period of fever—that is, till about August 8th. The temperature then became normal, and the pulse-rate between that date and September 1st varied between 88 and 104 per minute. Since the latter date the rate has gradually diminished, and on September 16th it was normal, and has continued normal.

The cerebro-spinal fluid was under very slightly increased pressure. It contained both cocci and bacilli, and there was practically no evidence of inflammatory reaction except at the second examination. It will be noted that three days previous to the withdrawal of this cerebro-spinal fluid the patient had received an intrathecal injection of antitetanic serum. This of itself produces leucocytosis in the cerebro-spinal fluid, but the number of leucocytes present was much larger than could be attributed to the antitetanic serum.

Differential Diagnosis from Tetanus.

In the early stages the condition resembled slight generalized tetanus. A slight rigor preceded the complaint of pain and stiffness in any of the muscles. He had received subcutaneously 1,500 units antitetanic serum on July 7th and 500 units on July 15th. With this amount of antitetanic serum and the long incubation period (ten days) one would have expected a more localized tetanus at the commencement. The condition gradually got worse till July 22nd, although treated as a case of tetanus.

Treatment.

From the commencement the patient received hexamine 40 grains daily and magnesium sulphate 120 grains every morning. He was kept on fluid diet until the temperature became normal, then on light diet until the pulse-rate was normal, and thereafter was given ordinary diet.

Lumbar puncture was performed five times. It would have been performed much oftener if symptoms had demanded it. There is no doubt that it greatly relieved the patient's condition; after each occasion on which cerebro-spinal fluid was withdrawn he was much brighter, his general condition was improved, his headaches became less severe, and the pain and stiffness were less marked. For the following twenty-four hours the improvement was maintained, but the various symptoms, after that period had elapsed, gradually recurred. After each lumbar puncture the condition was more improved than after the preceding one. Except on the first occasion, the punctures were performed under local anaesthesia.

Conclusion.

The good result in this case was probably more due to the frequent withdrawal of cerebro-spinal fluid than to hexamine. Antitetanic serum injected intrathecally would also have a beneficial effect, since it produces leucocytosis. No case of septicaemic meningitis should be looked upon as necessarily fatal. This case recovered, and that it was a true case of septicaemic meningitis is shown by the fact that the organisms present in the cerebro-spinal fluid were the same as those in the pus from the wound. There is also proof that the organisms were present in the blood (although no blood culture was set up), since he had phlebitis with no immediate external cause.

I wish to thank Captain A. N. McGregor, R.A.M.C.(T.), for his kind permission to place this case on record, and also Professor R. Muir, Lieut.-Colonel R.A.M.C.(T.), for the bacteriological examination of the cerebro-spinal fluid.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

"RABBIT GUT."

I DESIRE to draw attention to an intestinal condition which, though I expect it is familiar to many abdominal surgeons, has not, so far as I know, been described in print.

On inspection through an abdominal wound the small intestine is seen to be in a peculiar contracted state and of a characteristic grey-blue colour, very much resembling the normal appearance of rabbit's intestine.

It is found typically, but not necessarily, in emaciated anaemic patients the subject of chronic indigestion and intestinal pain. Through the thin and often retracted abdominal wall the peristalsis of the contracted coils is often visible.

My observations of these patients leads me to believe that the intestinal wall is definitely hypertrophied and that the pains they suffer are due to the spastic state of the bowel wall.

A very marked case of "rabbit gut" lately under my care determined me to write to you on the subject. It was that of a woman from whom I resected three years ago 5 feet of small intestine for acute volvulus. A year ago she began to suffer from attacks of abdominal pain which became so violent that a partial obstruction, due either to adhesions or contraction at the site of the anastomosis, was strongly suggested. I reopened the abdomen; there were neither adhesions nor constriction, indeed the site of the anastomosis was scarcely visible; but the small intestine was in a most typical state of "rabbit gut."

I hope that by calling attention to the condition other surgeons may be led to look out for it and study it.

London, W. VICTOR BONNEY.

A CASE OF PYORRHOEA ALVEOLARIS TREATED BY EMETINE.

A LADY, aged 26, had a fairly severe attack of measles in December, 1917. On February 11th, 1918, she called on me and complained that all her teeth were loose and that pus was exuding from all the sockets. I told her to swab the gums twice a day with ipecacuanha wine. This was continued till February 16th, when I obtained some emetine. From that date till February 27th I gave her daily a hypodermic injection of gr. ½ emetine hydrochloride (Allen and Hanburys) and continued the mouth-wash of ipecacuanha wine twice a day. The hypodermics were continued daily till March 6th, but the mouth-wash was changed on February 27th to emetine hydrochloride gr. ½, sod. chloridi ʒ j, aq. ad ʒ viij; to be used with one and a half times the quantity of warm water three times a day. The emetine mouth-wash was continued, but as the condition was steadily improving the injections were given less frequently (March 10th, 13th, 17th, 24th, 30th, and April 11th and 26th). The patient was then apparently cured and all treatment was stopped.

On August 1st her mother reported that at times she complained that the front teeth were a little loose, but there had been no discharge.

This is only one case, but, as a dentist had told her mother that no treatment would be of any avail but to extract the teeth, I consider it worthy of record and should advise further trial of this method, but not to persist with it should any septic symptoms, such as arthritis, supervene.

GEORGE P. BLETCHLY, M.B.Lond.

Nailsworth, Gloucestershire.

SOFT PARAFFIN AS A WOUND DRESSING.

THE statements in your review of Professor Rutherford Morison's book, *Bipp Treatment of War Wounds*, to the effect that "both bismuth and iodoform may prevent satisfactory *x*-ray pictures," and that "there may be more

danger of poisonous absorption of bismuth or iodoform," lead me to suggest a simple method of treatment which I used for years in civil practice in the case of lacerated wounds, as, for instance, fingers and hands crushed or torn by machinery—namely, the application of ordinary soft paraffin.

It is a most soothing treatment and frequent dressing is unnecessary. I used it in several cases at the regimental aid post when I was with a battalion; but, owing to the difficulty of following up cases, I never ascertained whether the surgeons were pleased or otherwise. If the results prove equally satisfactory in war wounds the above-mentioned disadvantages of bipp paste would be obviated; there might also be considerable saving of dressing materials, for, if the case required to be looked at in a field ambulance, the dressing put on at the regimental aid post could be reapplied.

WM. HAIG,
Major R.A.M.C.(T.).

ACUTE PNEUMONIA WITH DISPLACEMENT OF THE HEART TO THE SIDE OF THE LESION.

IT may be accepted as a clinical fact that cardiac displacement is one of the rarest accidents of pneumonia, the scarcity of records in the journals and of any mention of it in most of the great textbooks of medicine bearing this out, for should it happen its presence is unlikely to be overlooked in an illness where the heart is the especial object of our anxiety. So rare is it, indeed, that the recorder of any such instance must feel that the onus lies on him to prove that no pre-existing disease, more especially perhaps chronic in character without obtrusive symptoms, was present in the thorax to account for the facts. These conditions, I submit, are fulfilled in the following case by the previous good health, the clinical findings confirmed by *x*-ray examination, and the complete restitution to the normal under observation.

A private in an infantry battalion, in good health and hard condition, was wounded by shrapnel, on March 22nd, 1918, in the right lumbar region. He walked about five miles before reaching means of transport, and was exposed in the open throughout a bitterly cold night. Pneumonia seems to have commenced about March 26th; he remained very ill until shortly before crossing to England on April 10th.

His condition on April 11th was as follows: There was a big granulating wound in the right lumbar region about 6 in. by 1½ in., not penetrating abdomen or thorax. Temperature and pulse were normal. The left lower lobe of the lung was solid, dull, with tubular breathing, increase of vocal resonance and vocal fremitus, redux crepitation. The signs were those of a typical lobar pneumonia with commencing resolution. The remainder of the lung and the whole of the right lung were normal. There was no pleural effusion, cough was not severe; the expectoration was semipurulent, and showed nothing unusual on microscopic examination. The apex beat was 5 in. from the middle line, normal on inspection, no suggestion of hypertrophy; the right border of the heart did not reach to the left edge of the sternum, over which the percussion note was resonant. Sounds normal; no bruit. The heart, therefore, was quite normal, but was displaced to the left. At a later date the expansion of the right chest was quite evidently greater than on the left, the physical signs pointing to some temporary condition of compensatory emphysema which gradually subsided; the inflamed lung was slow in clearing, and on April 24th (about the twenty-ninth day of the pneumonia) some increase in vocal resonance and vocal fremitus, together with impairment of the percussion note, was still heard. The position of the heart was as before. An *x*-ray examination on May 7th showed displacement, with the apex 4½ in. from the middle line; no dilatation. Left lower lobe nearly clear; remainder of thorax normal. On May 18th the apex was 4 in. out, and on May 22nd had reached its normal site; lung normal.

Norris[1] has drawn attention to the possibility of mistaking displacement for dilatation in acute pneumonia. Herringham[2] published two fatal cases with displacement in each away from the side of the lesion, and this he explained by the "push" of the solid and therefore enlarged lobe. In my case the explanation presents greater difficulties. The displacement may conceivably have been due to the "pull" brought about by some collapse of a portion of the left lung, or—and I think more probably—by some changes in the right chest of which the emphysema there noted was a manifestation.

I am indebted to Lieut.-Colonel Maxwell Telling, the Divisional Medical Officer, for permission to publish this note.

REGINALD G. HANN, M.R.C.S., L.R.C.P.

[1] Osler and McCrae's *System of Medicine*, 2nd edition, Art. "Acute lobar pneumonia."
[2] *Proc. Roy. Soc. Med.* (Clinical Section), 1910.

TETANUS FOLLOWING SUBCUTANEOUS INJECTION OF GELATIN.

THE following is an account of a case in which a subcutaneous injection of gelatin, given as haemostatic on account of grave intestinal haemorrhage in typhoid fever, was followed by fatal tetanus.

S. D., aged 25 years, a tailor's presser, was admitted to hospital on July 30th, 1918, with a history of having been ill for six weeks. Influenza had been thought of as the cause. In the hospital the disease was considered to be typhoid fever. There was considerable fever, with moderate enlargement of the spleen, and deafness, but no rose spots were seen. On August 3rd there was much diarrhoea, and the faeces gave a positive reaction for blood (modified guaiacum test). Small doses of tincture of opium and bismuth were ordered.

On August 6th, owing to very severe intestinal haemorrhage, the house-physician gave a subcutaneous injection of "coagulose" in the afternoon, and about three hours later injected two pints of (sterilized) physiological saline solution under the skin. Next morning, for additional haemostatic effect, he injected 20 c.cm. gelatin under the skin (guaranteed to be sterilized for subcutaneous use). On August 9th one and a half pints of (sterilized) physiological saline solution were injected. On August 10th the faeces appeared macroscopically not to contain blood, though the modified guaiacum test still gave a slightly positive reaction.

On the afternoon of August 12th—that is to say, five days after the gelatin injection—the patient began to complain of not being able to open his mouth properly, and also of stiffness and pain in the muscles at the back of the neck and trunk. When I saw him, on the morning of August 13th, he certainly could not separate his jaws ("lock-jaw") and was suffering from frequently recurrent painful tonic spasms of the muscles of the back of the trunk and neck, also of the muscles of the abdominal wall and, notably, of the left thigh. It was, I should mention, into the left thigh that the gelatin had been injected on August 7th. The symptoms were typical of tetanus, and treatment was adopted accordingly; but death occurred in the afternoon of the same day (August 13th).

I sent details of the case to the coroner, and Dr. B. H. Spilsbury, who made the *post-mortem* examination, found (in addition to intestinal ulcers due to typhoid fever) a small abscess in the thigh, at the site apparently of the gelatin injection, and from this little abscess he obtained bacilli resembling those of tetanus. At the inquest a verdict was returned of death by misadventure, due to tetanus (in a man suffering from a disease resembling typhoid fever), in accordance with the medical evidence furnished.

It must, however, be acknowledged that the sequence of events above suggested has not been scientifically proved. In the first place, Dr. Spilsbury's investigations were not complete; moreover, the gelatin in the remaining ampullae (prepared in the same batch) were not examined for the presence of living tetanus bacilli. It might be suggested that the bacilli were otherwise introduced—for example, by an imperfectly sterilized syringe. Lastly, it is, I suppose, theoretically possible that a patient with open intestinal ulcers (typhoid ulceration of the intestine) might become infected with tetanus by way of the ulcers by tetanus bacilli, ingested with the food, in the intestinal contents.

London, W. F. PARKES WEBER, M.D., F.R.C.P.Lond.

Reviews.

THE ACTION OF MUSCLES.

AN author in seeking to justify the publication of an unnecessary book is apt to take refuge in the conventional phrase that "it is designed to supply a long-felt want." The author of this work on the *Action of Muscles*,[1] Dr. WILLIAM COLIN MACKENZIE, a distinguished graduate of the University of Melbourne, does not seek this conventional excuse, nor was it necessary, for the truth is that the want this book is designed and fitted to supply is one we never felt until we were suddenly called on to mend the crippling and maiming which result from war. Without doubt circumstances resulting from the war have suddenly made us dissatisfied with the inane and misleading teaching which we have reproduced generation after generation in our standard textbooks of anatomy concerning the action of muscles; but those who were watching the trend of events in medicine knew well that,

[1] *The Action of Muscles, including Muscle Rest and Muscle Re-education.* By William Colin Mackenzie, M.D., F.R.C.S.Edin., F.R.S.E., formerly Lecturer on Applied Anatomy to the Universities of Melbourne and Adelaide. London: H. K. Lewis and Co., Limited. 1918. (Med. 8vo, pp. xvi + 267; 99 figures. 12s. 6d. net.)

war or no war, a revolution in our teaching and knowledge of muscular action had become inevitable.

The events which were to lead up to that revolution one can gather from Dr. Mackenzie's experience. Some ten years ago he, as well as other thoughtful surgeons, were finding that re-education could effect an unexpected degree of recovery in the youthful subjects suffering from the effects of infantile paralysis. For the purposes of treatment an accurate knowledge of limb and body movement became necessary, but the only effective help which could be obtained was to be found not in our modern textbooks, but in the writings of John Hunter, Duchenne, and the lectures of the late Dr. Charles Beevor, which this JOURNAL had the prescience to publish at the time they were delivered (1903, i, 1357, 1417, 1481).

Dr. Mackenzie has availed himself of such help as these authors can give, and he has also done much more. He has gone, as John Hunter did, to comparative anatomy to learn function; he has studied, as Beevor did, the defective movements which result from nerve lesions, central as well as peripheral; he has worked as a clinical assistant in the military orthopaedic hospital at Shepherd's Bush, and realized that the rational methods of treatment which brought healing to the unfortunate subjects of infantile paralysis are equally effective in the treatment of men disabled in the war. In this book Dr. Mackenzie summarizes his experience, states the principles which guide him, and the exact methods he adopts in diagnosis and in treatment, and thereby has rendered a service of the first importance to orthopaedic surgery.

Dr. Mackenzie, in his teaching, is a devout follower of Owen Thomas—a believer in the curative effects of rest and a disbeliever in all forms of treatment which are meddlesome, showy, destitute of a rational basis, and designed to effect rapid cures. "It is wonderful," he writes, "what can be accomplished in a warm room with the aid of a table, a few pillows, and a sheet of powdered cardboard." No doubt fashionable or philanthropic visitors to our modern hospitals will be enamoured of the rooms which are fitted out with costly and complex apparatus for the treatment of disabled muscles, but time will show that the simple rational methods advocated in this book will yield better results and more of them.

As an illustration of his methods of re-education we may take their application to cases of musculo-spiral paralysis. In the period between the suture of the nerve and the first manifestation of the return of power the arm is placed in such a position that the paralysed muscles will be rested and the joints so fixed that the active muscles cannot drag upon and elongate their paralysed antagonists. The fingers are fixed in extension, the thumb is abducted and also extended to prevent shortening of the flexors and elongation of the paralysed extensors in the forearm. "No attempt at re-education should be commenced till we are assured that we have overcome flexor contracture. . . . For exercising, the patient should lie on the back with the head supported by a pillow, and the arm, with the elbow flexed, should rest on a firm pillow placed parallel to the patient's side. A sheet of cardboard should be placed under the limb." At first the surgeon is to seek for only minimal effects from the affected muscles, placing the hand, when the arm is removed from the splint, in the supine position, back of the hand down. In such a position, after the hand has been slightly flexed at the wrist, the weight of the hand comes in to help the weakened but recovering extensors of the wrist and fingers. Presently the patient is able to perform these movements when the hand is placed midway between supination and pronation, and therefore not assisted by gravitational effects; and at a later stage, when the hand is placed midway between pronation and supination, the extensors of the wrist are strong enough to extend the hand against gravity. It is clear that such methods need intelligence and patience, not only on the part of the surgeon, but also on the part of the subject of the treatment. But it is also clear that no machine, only the patient himself, can help in the recovery of a lost function.

Dr. Mackenzie has not only improved our means of treatment but added to our knowledge of muscular function. Of his personal observations only one example need be given here. The clawing of the hand—the hyperextension of the proximal or basal phalanx, and the flexion of the middle and distal phalanges, in ulnar paralysis—is well known, but the condition cannot be explained on the basis of our present anatomical teaching. It is true that Duchenne knew and taught that the common extensor of the fingers acted only on the proximal phalanges, but on anatomical grounds we have gone on teaching that it acts on and extends also the middle and distal phalanges. Dr. Mackenzie shows, on anatomical grounds, that Duchenne was right, and on physiological grounds that the lumbrical muscles are the opponents of the extensor communis and flex the proximal phalanges, while the antagonists of the flexor sublimis and flexor profundus, which act on the middle and distal phalanges, are the interosseous muscles. Hence, in ulnar paralysis, the lumbrical and interosseous muscles of the ring and little fingers, being thrown out of action, the proximal phalanges become hyperextended by the extensor communis and the middle and distal bent by the deep and superficial flexors of the digits.

In brief, Dr. Mackenzie has produced a work which should be studied and mastered by every orthopaedic surgeon. A. K.

CLINICAL CASE-TAKING.

DR. ROBERT D. KEITH has published an excellent little book on *Clinical Case-taking*.[2] It has grown out of his experience as principal and lecturer in clinical medicine in the King Edward VII Medical School, Singapore, and bears some traces of its adaptation to teaching in a tropical climate. But, as the author justly says, in view of the tropical nature of a large part of the British Empire, and considering that our campaigns in tropical lands will cause diseases peculiar to these regions to be seen in Britain much oftener in the future than in the past, it will be no disadvantage to the student to make himself acquainted with some of the elementary facts bearing on such conditions.

The idea underlying the book is that the student should do everything for himself and that thoroughness should be his watchword. The author utters a warning, which every one of us needs, against hasty assumptions and snapshot diagnoses. His book is intended to help the student to avoid such faults by training him to make a thorough examination upon a well-considered system in every case. Dr. Keith deals first with the general examination, including in that the history of the patient and his family, and a note of the general appearance presented. Then follow chapters on the several systems, including the excretory system, in which a very succinct but adequate account is given of the examination of the urine. This is followed by another chapter on microscopical examination of faeces, sputum, and blood. Search for ova in the faeces is a matter of particular importance in tropical climates, and a method of detecting small numbers of ova is mentioned which may be novel to many readers. It was used by the Rockefeller Commission in ankylostomiasis in Malay. A fairly thick suspension of faeces in a mixture of equal parts of glycerin and normal saline solution is centrifuged. A fragment of cotton-wool spread out like a fan is then laid lightly on the surface of the fluid in the tube and afterwards placed on a slide and covered with a cover-glass. As ova, if present, float on the top of the fluid they become entangled in the meshes of the cotton-wool and are thus easily detected.

Dr. Keith considers that the best way of teaching clinical medicine is by question and answer, but that method does not lend itself to print, as, indeed, experience has shown. His book will suggest to the student trained at the bedside the kind of questions he ought to put to himself when first he begins to make independent examinations. We would commend it as the considered work of one with a natural bent for clinical teaching.

THE SCIENTIFIC USE OF COAL.

THE serious warning issued by the Coal Controller last week as to the shortage of coal next winter will perhaps bring Professor BONE'S book on *Coal and its Scientific Uses*[3] more readers than could have been expected for it in normal times. Though it is a technical book, addressed to "the scientific public, and especially the chemical section

[2] *Clinical Case-taking: An Introduction to Elementary Clinical Medicine.* By Robert D. Keith, M.A., M.D.Aberd. London: H. K. Lewis and Co., Ltd. 1918. (Crown 8vo, pp. 104. 3s. 6d. net.)

[3] *Coal and its Scientific Uses.* By William A. Bone, D.Sc., Ph.D., F.R.S. 1918. London, New York, and India: Longmans, Green, and Co. (Med. 8vo, pp. xv + 491; illustrated. 21s. net.)

of it," the judicious skipper may yet find it interesting and intelligible. The book deals with most aspects of the coal industry; a short account of the origin and formation of coal is followed by a full discussion of its chemical composition, and of its combustion, and the later part of the book is occupied in the description of the various processes for cooking, gas-making, and obtaining by-products. There are chapters also on domestic heating and on the smoke nuisance.

The enthusiasts of the Smoke Abatement Society used to argue that the smoke palls were not only injurious to animal and vegetable life, but wasteful, urging that it ought not to pay manufacturers in Leeds, for instance, to send up volumes of smoke, containing 27 per cent. of carbon amounting to 220 tons a year to the square mile, and tar to the amount of 5½ tons. Professor Bone puts the total weight of soot and smoke produced in factory chimneys throughout the kingdom at approximately 6,000,000 tons a year, and the domestic smoke and soot at about half this. But domestic soot, as it contains more tar, is not so easily removed by rain and wind from anything on which it falls. Further, the proportionate effect of domestic smoke is presumably much greater in the winter than in the summer. The conclusion is that "weight for weight, domestic smoke is undoubtedly the more pernicious of the two in regard to its direct effects upon human and vegetable life and health, and in densely populated city or industrial areas the combined effects of the two must be very disastrous."

The main interest of Professor Bone's book to the reader who is not a specialist will be that it explains the ways in which, while economizing the natural resources of the country, we may rid ourselves of the smoke evil. "The present sordid ugliness," he says, "of our large industrial areas, largely caused as it is by the pall of smoke which continually hangs over them, is a standing reproach to our national economy, and we pay an appalling price for it both in direct loss and damage, and even more so in physical lowering of vitality and depression of spirits."

Professor Bone does not neglect to discuss the best way of burning coal on the domestic hearth, and, incidentally, to do justice to the work of Mr. Pridgin Teale of Leeds, but it is clear that his remedy is the gas fire both for cooking and heating. The use of both was rapidly extending before the war, and would have grown more rapidly if chemists and engineers had early devoted to their construction and their adaptation to domestic conditions the attention which the author and his colleagues, Professor H. C. Callender and Mr. Yates, have given in recent years. The objection the medical profession had to gas heating in living apartments is spoken of by Professor Bone as prejudice; it was a well-grounded objection, as indeed he himself admits when he says that "it has proved to be illusory, at least so far as any modern types of such fires are concerned." We can only hope that all newly fitted gas stoves are of these modern types.

The book is one of the monographs on industrial chemistry which Sir Edward Thorpe is editing, and we assume that it is to Sir Edward we should address a remonstrance about the index to the volume; it is not constructed on scientific principles, and for a book so full of detail is altogether inadequate. We desire to congratulate the publishers on their enterprise in arranging this series. We have already had the opportunity of noticing the first volume, Professor Morgan's *Organic Compounds of Arsenic and Antimony;* Professor Bone's volume is not less comprehensive and authoritative, while at the same time, as we have endeavoured to show, it is so well compiled and expressed that its scope can be appreciated and its contents understood by those who have no more than a general acquaintance with chemical science.

NOTES ON BOOKS.

DR. CHALMERS WATSON'S *Lectures on Medicine: A Handbook for Nurses*[4] is a well written and well arranged little volume giving a compressed account of the subject on the usual lines. As might be expected, it is particularly strong on the subject of diet, to which the last sixty pages are devoted. Nowadays nurses are usually so well taught that one ventures to ask if it would not be possible to set the whole subject of diet in disease on a quantitative basis in a book of this sort, giving the calorie values of some of the foods and the diets indicated. It is, after all, by its heat or energy value that a patient's diet is ultimately calculated or rationed; and unless the fact is pointed out in figures, the low calorie value of the diet given to most patients is apt to escape notice. Knowledge of the heat values of foods and diets is particularly desirable in nurses, as it is they who commonly deal out the food to their patients.

Dr. PAUL CARTON has written a book[5] on the treatment of children by the sun cure and by exercises. It is illustrated by a large number of photographs taken at the Hospice de Brévannes, to which he is physician. He has a high opinion of the advantages of regulated exercises or play in the sun for children, and believes that it is an advantage that they should have very little on.

Diabetes is a disease of great interest to medical men working in the East. Dr. WATERS has written a small book on the subject,[6] with special reference to India and the Indian standpoint, holding the view that a carbohydrate-free diet is not an impossibility in that land of excessive or almost exclusive carbohydrate alimentation. It is well written, and contains a full account of the starvation (or Allen) treatment of the disease.

[4] *Lectures on Medicine: A Handbook for Nurses.* By Chalmers Watson, M.D., F.R.C.P.E. Edinburgh: E. and S. Livingstone. 1917. (Cr. 8vo, pp. viii + 295. 4s. 6d. net.)

[5] *La cure de soleil et d'exercices chez les enfants.* By Dr. Paul Carton. Paris: A. Maloine et Fils. 1917. (Roy. 8vo, pp. 101; 60 original figures. Fr. 4.)

[6] *Diabetes: Its Causation and Treatment (with Special Reference to India).* By Ernest E. Waters, M.D.Edin., M.R.C.P.Lond., Lieut.-Colonel I.M.S. Calcutta: Thacker, Spink and Co. 1917. (Cr. 8vo, pp. 170. 4s.)

THE ACTION OF SUGAR IN PULMONARY TUBERCULOSIS.

ON June 15th (p. 678) a short account was given of certain observations by Professor D. lo Monaco on the treatment of pulmonary tuberculosis by the intramuscular injection of sterilized solutions of cane sugar. From a paper published by him in *La Renaissance*, June 22nd, 1918, it appears that he at first used hypodermic injections.

He states that at the Institute of Chemical Physiology, of which he is director, attention has since 1907 been directed to the investigation of the influence of sugar on organic secretions. Dr. Sterbini and Dr. T. Piantoni found in goats that sugar introduced hypodermically exerted a decided influence on the secretion of milk; it increased after small doses and diminished after large, without any change in the composition of the milk. These results were confirmed in women by Dr. U. Sammartino, who observed numerous cases at the obstetrical clinic at Rome. He showed that one gram of saccharose injected beneath the skin determined well marked increase in the secretion of milk, even in women who were undernourished. Injections of five grams, on the other hand, abolished the secretion altogether. Professor V. Nazari, Dr. Ricci, and Dr. d'Amato found that the same thing obtained in cows, an increase of from one and a half to two litres of milk a day being noted.

Later (1914) lo Monaco found that the saliva, gastric juice, pancreatic juice, bile, and urine similarly diminished with large doses and increased with small doses. Dr. Sammartino then showed that with artificial circulation in detached organs the blood vessels dilated under the influence of small doses and contracted with large doses. The reaction was rapid and pronounced. Increased bronchial secretion coincides with increased pulmonary circulation, and in acute catarrh the bronchial mucosa is reddened, swollen, and secretes a sticky, greenish, opaque or purulent liquid. Astringent and expectorant remedies are usually prescribed in such cases, but while their action on expectoration is easily demonstrated, the belief that they have a drying up action is not based on any experimental data. It was found that a gradual diminution of the bronchial secretion quickly followed subcutaneous injections of sugar. That this effect is due to the sugar was proved by suspending the injections before the process was complete, whereupon the expectoration set in afresh and soon became as copious as before. Observation went to show that this drying up of the secretion occurred when on clinical examination the lung no longer presented marked dilatation of the bronchioles or pulmonary cavities. As long as these lesions were present the expectoration diminished but did

not cease. The treatment is much more efficacious in non-infectious affections of the respiratory apparatus than in others, but in all it presents the advantage that the gastro-intestinal functions are not disturbed. The injections were not painful even when large doses of sugar were injected, when, for instance, the object was to arrest the milk secretion. In very emaciated persons it was found to be desirable to add a little cocaine to the solution. The treatment is simple: it comprises one injection of 10 c.cm. containing 5 grams of cane sugar, or two of 5 c.cm. containing 2.5 grams each. The fluid must of course be sterilized. Syrups enter largely into the composition of expectorant mixtures, their action being vaguely described as "emollient," but it is suggested that this action is due to vaso-constriction of the upper air passages which diminishes the tumefaction of the mucosa. Their effect is slight and fugitive, whereas that due to injections is more pronounced, more persistent, and is exerted on the respiratory tract as a whole. Allowance must also be made for the influence of sugar on the muciparous and lymphatic glands, and it is thought possible that the effect extends to the unstriated muscle fibres of the bronchi and bronchioles. This suggestion is based on the remarkably rapid recovery in two cases of whooping-cough after the injection of sugar.

Contrary to what has been said by some of the advocates of his method, Professor lo Monaco does not go farther than to claim that injections of sugar reduce bronchial secretion even in the gravest cases of tuberculosis. At the same time, cough and night sweats diminish and haemoptysis ceases. Observations made at the Polyclinic at Rome showed that in one case—that of a tuberculous woman in whom the daily amount of expectoration was between 42 and 70 c.cm.—a distinct improvement was noted at the end of five days' treatment, when the amount had fallen to 24 c.cm.; five weeks later expectoration was reduced to a negligible quantity—3 to 5 c.cm. a day—and the other symptoms had improved *pari passu*. In another case—a man with cavities, pleural adhesions, and haemoptysis—the condition was excellent after three months' treatment. In a third case—that of a young man with haemoptysis—twenty-four days' treatment put an end to the expectoration, and he was discharged as no longer requiring hospital treatment. In some instances the injection has been followed by fever and shivering lasting for some hours. This may be due to the fact that in certain subjects sugar, by raising the blood pressure, may determine the absorption of pyrogenous substances from the lung. Such an occurrence is rare, and is observed only after the first few injections.

Dr. C. F. KNIGHT, M.D., M.O. i/c troops, Witham Urban and Braintree Rural Districts, writes: Since 1883, when I was visiting physician and lecturer on clinical medicine and pathology to Mercer's Hospital, Dublin, I have used sugar for intramuscular injection in cases of tuberculosis (pulmonary and general), in neuroses, and in various forms of rheumatism and sciatica, with resulting improvement in the physical signs, muscular power, etc. The amount of sugar at my disposal being limited, I applied to the Special Diseases Subsection, Ministry of Food, for an extra 4 oz. a week, but have not yet succeeded in obtaining it, as the medical adviser says that it cannot be granted for preparing intramuscular injections; he suggests that I should use glucose instead. My theory is that the sucrose is oxidized and formic acid formed, and working on this idea I injected the acid, but had to give it up as the local reaction was excessive. Glucose does not form formic acid and is useless as a substitute for sucrose when given by intramuscular injection.

THE VOLUNTARY HOSPITALS AND THE PROPOSED MINISTRY OF HEALTH.

THE council of the British Hospitals Association proposes to hold a conference on Friday, October 18th, at 3 p.m., at St. Thomas's Hospital, to consider the relations of the voluntary hospitals to the proposed Ministry of Health, and invites suggestions to be addressed, before September 30th, to its honorary secretaries, 14, Victoria Street, Westminster, S.W.1.

With the notice is circulated a pamphlet, prepared by Mr. J. Courtney Buchanan, one of the honorary secretaries, and entitled *The Voluntary Hospitals and the Proposed Ministry of Health Bill.*[1] Its object is to place the various aspects of the subject in logical order, not to attempt to prejudge them in any way. It concludes by a series of fifteen propositions suggested for discussion.

The first proposition is that the voluntary hospital system should be permanently retained in this country. The second, third, and fourth are as follows:

2. That the function of the voluntary hospitals, which are medical, surgical, and nursing schools, should be to supply a special form of medical relief, namely, treatment by specialists, such treatment being made in every respect as perfect as possible, and the hospitals in which it is given equipped and maintained, in all their special and general departments, in the highest state of efficiency, and adapted to the requirements of the latest medical and surgical and nursing science and education.

3. That the service of the voluntary hospitals, supplemented where necessary by any service under the control of the new Government or municipal authorities, should be directed to the following three great purposes—namely:

(*a*) To treat the most grievous forms of disease;
(*b*) To raise the general standard of all medical and nursing education; and
(*c*) To advance and facilitate, with bacteriological and pathological investigation, scientific research.

4. That the great value of the voluntary hospitals (which are only a part, yet by far the most important part of the general medical relief of the sick poor) lies in their elasticity of organization and flexibility of adaptation; and they should be ready to fulfil their proper function in relation to all the other agencies, whether State, municipal, or voluntary, concerned with the general health of the community.

The fifth suggests the establishment of clinics or treatment centres in touch with the hospital. The sixth, seventh, and eighth are as follows:

6. That it should be possible to eliminate trivial cases, and obtain for treatment at the hospital all cases which are suitable not only on the ground of their serious character, but also having regard to their value for teaching purposes. Further, the link between the hospital and the treatment centres should facilitate the reference to the hospital of cases of which general practitioners desired confirmation of their diagnosis; but, whenever consultants at the hospital retain for treatment such cases, the patient's own doctor should invariably be informed.

7. That trivial ailments should not be treated in the hospital out-patients department; that special departments at special hours be opened for war pensioners; or, in the interests of teaching, that the number of chronic cases treated should, if possible, be limited. That as a general principle the patients should not be treated unless they bring a letter or report from their medical officers or attendants, except in cases of accident or other special circumstance or emergency. That the casualty and surgery departments of hospitals should be only for cases of serious accident or sudden emergency.

8. That, if in-patient treatment be necessary, the patient should be recommended by the doctor attending him to that institution best suited to his needs.

The ninth makes suggestions with regard to payments by insured persons and others who can afford something towards the cost of their treatment, and the tenth deals with distressed gentlefolk or members of the professional classes who are in real need of help. The eleventh urges full development of the almoner's department of the hospital; the twelfth deals with the nursing and after-care of patients in their own homes. The thirteenth is as follows:

13. That the staffs of hospitals should be prepared, where such work is not performed by the medical officer of health, to conduct special examinations of blood, urine, and sputum, take cultures, etc., for general practitioners when requested, and to report to the general practitioners from whom cases come, the results of such examinations; but that this be regarded as special work for which the medical staff might reasonably expect to be paid.

The fourteenth suggests that the lay administration should as far as possible be continued and retained, and the fifteenth proposes that steps should be taken to educate the general public as to the importance of maintaining the hospitals at the fullest efficiency on voluntary lines.

In an earlier section Mr. Buchanan expresses the view that the propositions put forward will be found not to be at variance with the provisions of the scheme of the British Medical Association in the pamphlet *A Ministry of Health*. The statement therein, it is observed, deals with the question from the point of view of the medical profession, and the following comment is made:

This is a point which compels the most serious consideration, especially having regard to the strengthening in the profession's organization. The British Medical Association have shown their intention to assist the Government with their proposals, and to help on reforms and changes introduced by the Government which they recognize as for the good of the community as a whole; but their intention is also, and equally, to see that such reforms and changes are not introduced "over their heads or behind their backs."

[1] London: The Scientific Press, Ltd. (Southampton Street, Strand, W.C.2). (6d.)

British Medical Journal.

SATURDAY, AUGUST 24TH, 1918.

THE COMING GENERAL ELECTION.

THE position of politics to-day is curious, and, so far as the House of Commons is concerned, without precedent. The agents and organizers of the old parties are obviously perplexed, and only the new reconstituted Labour party, seems to know its own mind. The last general election took place nearly eight years ago, and the present House of Commons has extended its own life five times. No House of Commons for two centuries has had so long a life. It seems to be generally admitted that it no longer represents the electorate. It is true that about half its sitting members have been returned since it came into existence in December, 1910, but most of them have been elected under the conditions of the party truce without any serious contest. Whatever force there might have been in an argument in favour of any further considerable prolongation of the life of the present House of Commons, founded on this infusion of new blood, has been destroyed by the action of the House itself in passing the Representation of the People Act, which became law on February 6th, 1918. This new Reform Act so extended the franchise as to add to the electorate a far larger number of persons than any of its predecessors. The number is now more than double what it was, the magnitude of the increase being largely due to the inclusion of women. The Act also increased the number of members, and made large alterations in the distribution of seats. Constitutional practice points strongly to the dissolution of a Parliament which has adopted a Reform Act so soon as the new register can be got into order. The Local Government Board has had seven months to get on with the work of registration, and there is a strong and influential body of political opinion which desires a general election in the early autumn in spite of the difficulties which would be encountered in carrying through arrangements for voting by post and by proxy. On the other hand, political extremes seem to have met in urging that there should be no general election before at earliest next spring, and there are some who would wish to postpone it until the war is over. The latter opinion is not likely to prevail, and the prudent course for all who desire to influence the constitution of the new House of Commons is to assume that the election may take place as early as November; otherwise they may be caught napping.

A great deal has been written and spoken for a good many years past about the need for a larger number of medical men in the House of Commons. It has been said with truth that such increase would add to the wisdom of that assembly, would be for the benefit of the public, and would be a direct advantage to the medical profession itself. Now is the time to put these precepts into practice.

The Annual Representative Meeting last month expressed the opinion that the medical profession should be more fully represented in the House of Commons, and that a voluntary fund should be raised to assist the candidature of such members of the medical profession as might be approved as candidates. It referred the matter to the Council, which at once appointed a special committee. This committee, as is noted in the SUPPLEMENT, met on August 7th, and it was then decided to issue a circular letter to Divisions requesting them to take immediate steps for the inauguration of the fund.

We have endeavoured to set out above the considerations which make it not improbable that a general election may take place within the next three or four months, and if this expectation be fulfilled there will be little time to raise a fund or to establish any central organization. In these circumstances we venture to think that the executive officers of the Divisions of the Association in Great Britain will be well advised to look into the situation in the constituencies with which the Division has to do. It might be possible to discover unavowed ambitions for a political career among their own members, but, failing this, opportunity could be taken from the first to have a share in the selection of candidates, and to impress on selected candidates the views of the medical profession with regard to the many questions affecting the public health and the future of medicine which must be discussed and decided in the new Parliament.

Again, in certain of the universities the influence of the medical graduates ought to be very considerable, if not preponderating, and it is disappointing that so little seems to have been done to move medical graduates to make their influence felt in the selection of candidates for the universities. In this instance at least the out-of-date catchwords of the party politician might be forgotten. The number of members the universities of the United Kingdom are entitled to elect has been increased from seven to thirteen. The University of Wales, the National University of Ireland, and Queen's University of Belfast each receive one member, and the combined universities of Durham, Manchester, Leeds, Sheffield, Birmingham, and Bristol, voting as one constituency, two members; the four Scottish universities, which will in future vote as one constituency, will have three representatives instead of two. In a university constituency having more than two members a contested election will be conducted according to the principle of proportional representation, each elector having one transferable vote, and an elector may vote by proxy. For Queen's University, Belfast, Sir William Whitla has come forward; for the three seats of the Scottish universities there are four new medical candidates; and there is every reason to expect that Sir Watson Cheyne, who now represents the universities of Edinburgh and St. Andrews, will stand for the combined constituency. The University of London has no medical candidate, but the medical profession is not likely to forget the services rendered to it in the present Parliament by Sir Philip Magnus, the sitting member. No definite steps, so far as we are aware, have yet been taken by the medical graduates of the combined English universities, but we hope that they will not neglect this opportunity of returning a member of the medical profession. Of Oxford and Cambridge we can say nothing more than that the latter has not infrequently elected a man of science as one of its representatives, while the former seems generally to have looked for political eminence already achieved.

We venture to say that the very brief statement here given of certain aspects of the political position to-day, and of the near prospect of a general election, is sufficient to justify an appeal to the medical profession to bestir itself before every opening is taken up.

THE SYMPTOMS OF ACUTE CEREBELLAR INJURIES.

AMONG the ways in which the experience of the war is being employed to advance medical knowledge is the careful analysis of cases in which shell or bullet wounds have picked out parts of the body comparatively seldom the site of uncomplicated disease or of injuries in ordinary times. Thus, earlier in the war Gordon Holmes and Sargent established the syndrome of wounds of the superior longitudinal sinus in the skull. Similarly, the opportunities afforded by wounds of the cerebellum have been utilized by Gordon Holmes,[1] who has seen forty such cases and been able to investigate thoroughly twenty of them. They were mainly recent and unilateral lesions, though seven bilateral and a few old-standing cases were available for comparative study. This research is especially valuable, not only on account of its philosophical tone but also because there is considerable divergence between the symptoms usually described as characteristic of cerebellar disease and those obtained by physiological experiment. The effects of tumours, abscesses, haemorrhage, and softening are seldom so confined as those of the experimental operator, whose results may be reproduced by chance gunshot wounds. In these circumstances the skilled clinical observer has the advantage over his physiological colleague in the intelligent co-operation of his patients, and can consequently employ more numerous methods better adapted to the purpose for the observation of the effects produced by various lesions, especially as regards subjective manifestations. As Gordon Holmes's observations have been made on injuries closely resembling those on which the classical physiological descriptions are based, it is not surprising that a close similarity is shown between them, the chief differences probably depending on the position of the subject in the phylogenetic scale, and on the relative importance or subordination of the cerebellum in the nervous system of different animals.

Cerebellar injuries produce almost exclusively motor symptoms, and in the early stages of an acute lesion loss or diminution of muscular tone in the limbs, and to a less extent of the trunk, on the same side of the body as the lesion is a prominent feature; this hypotonia, which gradually diminishes with time, is uniform, and André-Thomas's anisosthenia, or loss of tone in some muscles with relative hypertonicity of their antagonists, though looked for, was never detected. Asthenia, as shown by Castex's dynamometric apparatus, and slowness of the muscular contractions and relaxations, as illustrated by tracings, ataxia, the "rebound phenomenon," and Babinski's adiadochokinesis, are the disturbances of voluntary movement found. Giddiness is extremely common after all gunshot injuries of the head, and nearly all the patients with cerebellar injuries become giddy immediately or on regaining consciousness. Abnormal attitudes, so prominent in experimental animals, are much less constant and striking in man. Nystagmus was present in almost every case with any disturbance of function, and is a clinical sign of the highest importance; it is essentially a fixation nystagmus, and differs in many particulars from that due to labyrinthine destruction. Apart from the oculomotor, the only cranial nerves obviously affected by unilateral cerebellar lesions are those concerned in phonation and articulation. Sensation was never affected in any way.

In order to obtain an insight into the normal functions and physiology of the cerebellum, Gordon Holmes has undertaken the difficult task of analysing and attempting to resolve these numerous functional disturbances into their simplest components. In the first place, he concludes that from their nature, constancy, and persistence the symptoms are mainly due to destruction of the cerebellum; vertigo, which is inconstant, variable, and only occurs early after the injury, being an exception and probably irritative in origin. His observations do not support the view held by many physiologists and clinicians that the predominant function of the cerebellum is the maintenance of equilibrium; neither do they lend any support to the existence of focal localization of function in the cerebellar cortex, though they cannot be accepted as proof that such localization does not exist. There is, however, no doubt that the relative prominence of various symptoms, such as tremor, slowness and inco-ordination of movement, as well as nystagmus, varies with the site of the lesion, and this question the author hopes to consider in a future paper.

[1] *Brain*, London, 1918, xl, 461–535.

YOUNG RECRUITS.

FRANCE is calling up the class of 1920. Some anxiety has been expressed lest some of these lads may not have reached the degree of physical development which would enable them to undergo military training without permanent injury. M. Clemenceau has issued a vigorous circular which, from its tone and style, his fellow countrymen believe he must have written with his own hand. The substance of the circular makes it plain that when he sat down to write it the French Premier did not put aside his medical knowledge. In crisp sentences he tells the medical members of the examining committees to reject all but the perfectly healthy and robust, and defines what he means by these words in very clear terms. He concludes as follows: "Insufficient selection, by which the quality of recruits is sacrificed to the numerical importance of the contingent, would be directly opposed to the object in view. In a very short time it must lead to a failure in physical development and consequently to loss of effectives, and must tend to produce a soil favourable to tuberculosis, and conduce to the onset and dissemination of divers infectious and epidemic diseases. In a word, it would endanger the health of the troops, the progress of their education, and their ultimate military value. A very rigorous selection of the contingent is something more than a medical and hygienic necessity: it is essential to the true military needs of the country."

PREGNANT WOMEN IN INDUSTRIAL WORK.

IN an address delivered to the Welfare Conference held recently at Oxford, Dr. Deacon, the woman medical officer at a national shell filling factory in the north-western area, referred to the maternity problems amongst employed married women. Of the total number of women employed in the factory rather more than half were married. Records were kept in 101 cases with a view to noting the effect of the work on women who became pregnant. At the time of the completion of the report, pregnancy had terminated successfully in 64, and unsuccessfully in 15. Thirteen of the unsuccessful cases were very early miscarriages (of some few weeks' date) and mostly quite unassociated with the work. One woman, for example, had experienced several previous miscarriages; a second had had tuberculous trouble; a third fell out of bed whilst dreaming; and a fourth fell downstairs when at home. All the women seen had good health whilst pregnant, very easy confinements, and gave birth to healthy children. One woman, who worked until ten days before her confinement, reported the birth of the first healthy child out of eight. Another had reared previously only one child out of twelve; and yet another stated that the

child born during her war-time work at the factory was the healthiest baby of seven. Such a record tends to confirm the opinion that if factory work were wisely allocated to the pregnant woman—that is, if suitable light tasks were found for her—she could stay at work earning sufficient money to keep her well fed and in comfort. The general conclusion would seem to be that, as in the easy classes and among women who share in the work of a small holding, so in women engaged in industrial occupations, reasonable work and exercise, and good food, are the proper preparations for childbirth. After childbirth different considerations arise, and Dr. Deacon is probably right in holding that, if possible, a mother should abstain from outside work for at least three months after confinement, both in order to regain her normal state of health and to nurse her baby for that period.

THE DIAGNOSIS OF GALL BLADDER DISEASE.

A keen believer in the importance of early surgical interference in gall bladder disease so as to obviate later and severe complications, Bodenstab[1] has analysed with a view to early diagnosis the clinical pictures of 500 cases of cholecystitis subsequently submitted to operation. The cases fall into two groups—340 with calculi and 160 without; of the 340 calculous patients 304 were women and 36 men, whereas in the other group there were 40 men and 120 women. The reason why so many cases of cholecystitis or cholelithiasis are taken, or rather mistaken, for gastric disease is that their symptoms are referable to the stomach—the "inaugural symptoms" of gall stones described ten years ago by Sir Berkeley Moynihan—but they are reflex symptoms and in no way related to meals. Five cardinal symptoms of gall stones are described: Radiating pains from the epigastrium to the right or left costal arch, to the back or to the shoulder, found in 72 per cent. of the calculous and in 38 per cent. of the non-calculous cases; flatulence in 80 per cent. of the calculous and 67 per cent. of the non-calculous patients; vomiting in 79 and 47 per cent. in the two groups; dyspnoea in 72 and 39 per cent.; and prostration with a feeling of impending death recorded in 28, but probably present much more often in the calculous cases, and in 4 per cent. of the cases without gall stones. Tenderness over the gall bladder was present in 94 per cent. of the cases without stones, and in 86 per cent. of the calculous cases. About 23 per cent. of the gall stone cases gave a history of jaundice, as compared with 8 per cent. in the other group. The duodenal tube of Einhorn, used in approximately a hundred cases, gave little assistance; it provided infected bile and mucus in a case with an apparently normal gall bladder, and on the other hand sterile golden yellow bile in patients with cholelithiasis. In spite of the ability of Case, Pfahler, and George to detect gall stones skiagraphically in 50 to 85 per cent. of their patients, Bodenstab did not find this a guide of great value, and concludes that reliance must still be placed on the older methods of diagnosis rather than on the more modern *x*-ray and laboratory methods such as gastric acidity. In 90 per cent. of the cases a correct diagnosis can be made from the history alone.

THE VALUE OF INFECTIOUS HOSPITALS.

Many London practitioners have probably been surprised by the receipt of a circular letter from the medical officer of health embodying a request made by the Metropolitan Asylums Board that mild cases of scarlet fever and "bacteriological diphtheria" should be treated in their own homes, thus leaving beds available for the more serious cases. The request is made on the ground that the military authorities have recently taken over additional hospitals from the Metropolitan Asylums Board, thus curtailing seriously the accommodation for infectious cases. This action of the Board suggests that a very pronounced change has taken place in its opinion with regard to the function of fever hospitals. If isolation of patients suffering from the diseases named has any effect on their prevalence, it is clear that to leave slight cases unisolated might involve a serious risk of increased epidemic prevalence. If, on the other hand, the Metropolitan Asylums Board authorities have, under the pressure of war conditions, come to the conclusion that the main function of fever hospitals is to provide efficient care and treatment for serious cases which cannot be properly looked after at home, then it would seem essential that a reasoned statement should be put out; otherwise practitioners will be left in a state of uncertainty as to the true functions of these hospitals. The action of the Board also raises one or two other considerations. Very large sums of money have been spent on infectious hospitals, undoubtedly in the belief originally that the prevalence of infectious disease would thereby be greatly reduced or even abolished. If this purpose has failed of achievement the question may be raised whether it is wise, in the early days of an experiment of which the results cannot be foretold, to lavish money on bricks and mortar. Experience in the war has abundantly shown that much less expensive structures suffice. Another important consideration arises owing to the assumption, which seems very generally to be made, that the Ministry of Health, if it comes, will be a large administrative body taking over the functions of existing departments. Is it not possible that greater good would be derived from a body designed to investigate and advise on such questions as that now under discussion? If it were one of the duties of the Ministry of Health to inquire into the real value of fever hospitals, and having done so to make a pronouncement for the guidance of local administrative bodies, it is possible that far greater efficiency in public health matters could be combined with reasonable economy.

THE WOUNDED IN AGRICULTURE.

M. J. Gourdon, an officer of the French Medical Corps, who is director of the training school at Bordeaux for men who have lost a limb or been otherwise crippled in the war, presented recently to the Académie de Médecine a report based on 5,014 men, of whom 30 per cent. had been wounded in the upper limbs. Of the grand total 73 per cent. had been able to resume their occupations without any special training, either with or without the help of artificial appliances; the remainder required re-education. He notes that there is often want of will power, which may lead to a disinclination to resume work, to adopt the occupation in which there is the best chance of succeeding, or to persevere during the period of education. This frame of mind perhaps explains the differences in results obtained among men previously engaged in agriculture, who constitute 62 per cent. of the patients at the Bordeaux centre. The improvements in the artificial appliances supplied at Bordeaux to every man engaged in agricultural pursuits have been so considerable that 85 per cent. of farmers or owners of small holdings have gone back to their previous occupations, but only 48 per cent. of wage-earning labourers have returned. The value in agriculture of the work of a man who has lost a hand, or undergone amputation through the forearm, is nearly normal; that of a man who has undergone amputation of the arm is 75 to 85 per cent. of the normal, but the work of those who have undergone disarticulation at the shoulder is only 40 or 50 per cent. of the normal. It is estimated that a man who has lost a lower limb or been seriously crippled can work at many industrial trades with the loss of only 10 per cent. of efficiency. The loss of an upper limb reduces a man's working power in nearly every industrial trade; it is 50 to 75 per cent. of the normal in basket-making, and 40 to 50 per cent. in machine works; it is, however, nearly normal in electric welding. The

[1] W. H. Bodenstab: *Journ. Amer. Med. Assoc.*, Chicago, 1918, lxxi, 12-15.

general conclusion is that the great majority of men who have lost a limb or been seriously crippled can engage in some sort of work, but to attain this end a man's attention should be directed from the first to some suitable occupation, and great care should be taken to adapt the artificial appliance to the particular needs of the individual. M. Gourdon considers that re-education should begin as soon as the wounds have healed and before a man is discharged from the army, and he suggests that men who make themselves efficient should receive an addition to their pension. He agrees with most other observers in thinking that the best plan is, if possible, to help a man to go back to his old trade.

A CAUSE OF DROWNING IN SWIMMERS.

THE bathing season makes a note by Walter Robert Shaw, assistant professor of botany in the University of the Philippines, Manila, which appears in *Science* of July 12th, especially opportune. He describes an optical illusion which he thinks has probably led to the drowning of many capable but inexperienced swimmers. A person swimming with the wind, and therefore with the waves which travel in the same direction faster than it is possible to swim, receives the impression of being carried backwards in the water. Want of knowledge of this fact makes most people in such circumstances, if headed towards the shore, immediately think of "undertow" and believe themselves to be caught in an offshore current. The instinct of an untrained swimmer always leads to nervous haste and over-exertion in deep water, even under conditions most favourable to swimming. When the instinct is reinforced by the panic engendered by the belief that he is caught in an "undertow," the resulting increase of effort and acceleration of action reduce efficiency to a degree that must certainly have left many fatally exhausted before they reached a footing. Shaw's attention was first called to this matter by two cases of able-bodied but indifferent swimmers who, after going out just beyond their depth in an onshore breeze at Pasay Beach, near Manila, returned to the bathhouse exhausted and reported that they had been caught in an "undertow" with a nearly fatal issue. In each case he made immediate investigations of the water at the point indicated and found neither "undertow" nor offshore current sufficient to trouble any swimmer. On numerous subsequent occasions, while initiating beginners in the art of deep-water swimming, being headed for shore with an offshore breeze, he has heard the pupil anxiously declare that there was a current against him. The feeling of being carried backwards may, according to Shaw, be explained as analogous to the effect commonly produced on a person seated in a stationary railway carriage when a train on an adjoining line moves forward. More strictly, it might be compared to the effect produced by two trains, one on each side of the stationary carriage, moving forward at the same speed. Shaw concludes that when this optical illusion is made a matter of familiar knowledge by textbooks of physics, physiology, and physical culture there will be less danger in open-air swimming for those trained in tanks, ponds, and rivers when they go out of their depth in larger bodies of water. A swimmer should choose fixed objects by which to gauge his progress.

DR. JOHN HALL, SHAKESPEARE'S SON-IN-LAW.

IN a paper read before the Historical Section of the New York Academy of Medicine Dr. Eli Moschcowitz[1] gave an account of this practitioner without a medical degree, who married Susanna, Shakespeare's elder daughter, in 1607, settled at Stratford-on-Avon, and died there at the age of 60 in 1635. During these twenty-eight years he had a varied practice and necessarily attended people related and known to the immortal William, such as Michael Drayton the poet, Captain Bassett, his own wife, and their only daughter, at whose death, in 1670, the last descendant of the poet disappeared. Not a great physician, Hall is rescued from oblivion by propinquity, especially as it is suggested that, since he must have been known to Shakespeare for at least nine years, he may have contributed to the poet's acquaintance with medicine. An argument in favour of this is that most of Shakespeare's knowledge of things medical is displayed in his tragedies which were written in his later years. Hall left behind him a case-book, written in Latin, of which Dr. Leftwich gave an account to the Shakespeare Association, as noted in these columns last March. It related cases of most diverse kinds—dropsies, epilepsy, sterility, melancholia, and cancer among them—all cured by an extensive materia medica, including the dried trachea of a cock and the dung of various animals. These notes were translated by a Linacre professor into English, and brought out by James Cooke, a surgeon, after Hall's death. The book appeared in 1657, and fresh editions were brought out in 1679 and 1683, its popularity being possibly due to its optimism. Dr. Moschcowitz, who analyses some of the cases, is more daring than Sir Sidney Lee in the *Dictionary of National Biography*, and suggests that Hall attended Shakespeare in his fatal illness, and that had he been willing to publish his failures as well as his cures, an account of the poet's death might have been vouchsafed us. As it is, our only information is that, at "a merrie meeting" with Michael Drayton and Ben Jonson, Shakespeare "drank too hard, for he died of a fever there contracted on April 23rd 1616, aged 52 years." This is from the pen of the Rev John Ward, vicar of Stratford-on-Avon from 1662 to 1681 who was the subject of Mr. D'Arcy Power's interesting presidential address to the Medical Society of London in October, 1916. Hall is said to have become more puritanical with advancing years, and, as Shakespeare's executor, to have been to blame for the loss of the manuscripts of his plays.

[1] Eli Moschcowitz, *Johns Hopkins Hosp. Bull.*, Baltimore, 1918, xxix, 148–152.

VENTRICULAR FIBRILLATION WITH CARDIAC RECOVERY.

IT is generally believed that ventricular fibrillation in human beings is immediately followed by death, although Gunn has shown that in small animals, such as the rat, recovery is not uncommon. Ventricular fibrillation appears to have been proved in man by means of the electro-cardiograph in nine cases only, seven of which were recorded by Robinson. In another remarkable case, recorded by G. C. Robinson and J. F. Bredeck,[1] fibrillation of the ventricles was shown to be present by the electro-cardiograph during an attack of cardiac syncope thirty hours before the death of a woman with mitral stenosis and aortic disease. Electro-cardiograms taken after this attack showed the presence in the ventricles of functional abnormalities of very various forms. These abnormal complexes indicate that the cardiac impulses were arising in various points in the ventricles, travelling along abnormal paths in the ventricular muscle, and that many were travelling with abnormal slowness. These abnormalities were specially noticeable after the intravenous injection of strophanthin (1 mg.), and resembled the deranged cardiac mechanism observed experimentally by Levy and Lewis during the so-called state of potential fibrillation. Robinson and Bredeck have, indeed, seen these electro-cardiographic changes in a patient who died suddenly after strophanthin, but at that time did not recognize their significance; other sudden deaths have occurred after strophanthin, possibly from ventricular fibrillation. This disturbance of ventricular conduction can be detected by the electro-cardiograph, and contra-indicates the use of drugs such as chloroform, epinephrin, and strophanthin, which dispose the heart to ventricular fibrillation.

[1] G. C. Robinson and J. F. Bredeck, *Arch. Int. Med.*, xx, 725–738.

TUBERCULOSIS IN NAVAL DOCKYARDS.

A rumour mentioned to us by a correspondent to the effect that there was a considerable prevalence of pulmonary tuberculosis among men employed in dockyards led us to make some inquiries. We are indebted to the Medical Director-General R.N. for information which would appear to show that the rumour is unfounded. The number of cases of tuberculosis in the returns from one of the principal dockyards during the years 1915, 1916, 1917 was 99, out of a total complement of over 15,000; this gives an annual average of 33 cases, or 0.2 per cent. By Admiralty orders notices are placed in workshops and other places forbidding spitting. Punishment for violation of the order is, under dockyard regulations, checking of wages or dismissal. No persons suffering from tuberculosis are, we are informed, allowed to return to work unless certified by the local tuberculosis officer to be non-infectious; even in such cases only outdoor work is allowed as far as possible.

HERPES ZOSTER AND VARICELLA.

The evidence in favour of a connexion between herpes zoster and varicella has been dealt with by Dr. W. P. Le Feuvre of Bulawayo in various communications to medical journals, and recently he has returned to the subject in an article on "The aberrant vesicles of herpes zoster" in the *Medical Journal of South Africa* (March). He has brought forward evidence to show that cases of herpes zoster may (as there is abundant evidence to prove) be accompanied by an outbreak of "aberrant vesicles," which he suggests represents a generalized varicella eruption; secondly, he has endeavoured to establish the proposition that patients with herpes zoster may infect other persons with varicella, and, conversely, that patients suffering from varicella may sometimes give rise to herpes zoster amongst those about them; thirdly, he points out that herpes zoster and varicella occasionally occur side by side in the same period. It may, however, be questioned by any one familiar with the literature on the subject whether all the evidence really suggests more than that there are cases of varicella with a peculiar herpes zoster-like grouping of all or most of the vesicles, so that they may be easily regarded as cases of true herpes zoster (with or without "aberrant vesicles"); and, secondly, that there are cases of herpes zoster accompanied or "represented" by a generalized eruption of vesicles, so that they are accepted as genuine examples of varicella.

DIABETES INSIPIDUS AND THE PITUITARY.

Some cases of diabetes insipidus have been thought to be due to over-activity of the posterior lobe of the pituitary, the extract of which has been shown by Schafer to have a diuretic action, and it would therefore be expected that experimental removal of the posterior lobe would diminish the urinary output, but Cushing found that a transitory polyuria almost always occurred, particularly after operations necessitating manipulations of the stalk of the hypophysis and thus liberating excess of the secretion of the posterior lobe. In a short paper on the control of diabetes insipidus by means of subcutaneous injection of extract of the posterior lobe (and pars intermedia) of the hypophysis in a multiglandular endocrinopathy (thyreo-hypophyseo-genital syndrome) Lewellys F. Barker and M. Hodge[1] state that all the recent evidence shows that diabetes insipidus is due to under-function of the pars intermedia, and that one of the most brilliant results of substitution therapy is the control of polyuria and polydipsia by injections of the extracts of the posterior lobe and pars intermedia of the hypophysis. Their patient showed symptoms of hyperthyroidism and also signs possibly pointing to implication of the (*a*) adrenal cortex, namely, hypertrichosis of the masculine type and well marked hypertrophy of the mammae and labia minora, there being no reason to consider that the chromaffine system was abnormal, and (*b*) of the pituitary. Hypodermic injections of Armour's pituitary liquid, usually 2 c.cm. daily, produced a fall in the amount of urine and a rise in the specific gravity. Barker and Mosenthal previously found that 1 c.cm. twice daily satisfactorily controlled the fluid intake, the urinary output, and the specific gravity of the urine in a woman who when untreated passed from 8 to 11 litres of urine daily.

[1] *Endocrinology*, i. 427–432.

ANTIVIVISECTIONISTS AND THE RED CROSS.

It is a little difficult to understand the state of mind of persons who will give money to the Red Cross for the purpose of treating soldiers attacked by disease but object to any part of their gift being used for the discovery of means of preventing disease, and thereby saving suffering and permanent or long-lasting disability. But this, as we have already noted, has been the experience of the American Red Cross. A sum of 165,000 dollars was voted by its War Council in two appropriations for medical research, and a number of important subjects have already been investigated by means of these grants. One such subject is the etiology of trench fever, with regard to which most valuable results have been obtained, indicating that the disease is transmitted by the louse and the conditions in which this occurs. Another subject upon which light has been thrown is the nature and treatment of wound shock. The researches of Professor Cannon and his colleagues have done much to explain the phenomena of shock, and have placed in the hands of surgeons valuable means of treatment which have already saved thousands of lives. The American Red Cross has now received from Mr. Cleveland H. Dodge, of New York, a letter authorizing it to set aside and create a restricted fund of as much of his contribution to the second Red Cross War Fund, not exceeding 250,000 dollars, as may be necessary "for the proper and most thorough-going conduct of medical research designed to ascertain methods for the prevention and cure of diseases and wounds to which soldiers and sailors may be exposed." He also authorizes the American Red Cross to utilize part of this money to reimburse the first Red Cross War Fund for the appropriations already made for medical research, as well as for future expenditures for research work at home and abroad. Reimbursement has now been made and this particular grievance of the antivivisectionists is thus removed. As Mr. Davison, chairman of the War Council of the American Red Cross Fund, has well observed, the solution of such problems as the treatment of wounds, and especially of compound fractures, the eradication of lice and other parasites, the treatment of trench nephritis, and of the effects of lethal gas "will not only contribute toward the relief of suffering, but toward more effective prosecution of the war."

An Order in Council has been issued extending the term of office of the existing direct representatives on the General Medical Council until December 31st, 1919. Accordingly, no election of direct representatives will fall to be held in the present year.

The Food Controller has given notice that he is prepared to grant licences for the sale of milk at prices exceeding those specified in the Milk Order provided that the producer fulfils the conditions laid down by the Local Government Board, of which we gave particulars a short time ago.

A grant of £10,000 has been made to the Royal Free Hospital by the American Red Cross Commission for Great Britain for an extension of the maternity department, and it has been decided to take over and extend the maternity hospital hitherto entirely supported by the Duchess of Marlborough, which at present provides for the treatment of twenty patients. It is intended, as soon as the necessary arrangements can be carried through, to provide fifty beds for maternity cases, and to extend at this centre maternity training for the nursing staff of the Royal Free Hospital and other pupils; there are already vacancies for probationers.

THE WAR.

NEW METHODS OF DISINFECTION FOR THE PREVENTION AND ARREST OF LICE-BORNE DISEASES

(TYPHUS, RELAPSING, AND TRENCH FEVERS).*

BY

COLONEL WILLIAM HUNTER, C.B., A.M.S.,

PRESIDENT OF ADVISORY COMMITTEE FOR PREVENTION OF EPIDEMIC DISEASES IN EASTERN WAR AREAS, 1915-17; COLONEL IN CHARGE OF BRITISH MILITARY SANITARY MISSION TO SERBIA, 1915; CONSULTING PHYSICIAN TO THE EASTERN COMMAND.

THE subject of this lecture relates to the prevention of lice-borne diseases—typhus, relapsing fever, and trench fever. I am not concerned with the evidence as to the lice-borne character of these diseases, nor with the life habits of lice, nor with the degrees of heat required to kill them, but with killing them in masses by an overwhelming amount of steam in the presence of which all life is impossible. Nor am I concerned with the conditions favouring lousiness. The whole matter is much simpler—namely, want (1) of water and (2) of conveniences for disposing of it. My experiences have lain in two areas—Egypt, the waterless and lice-plague stricken land, and the Balkans, where water indeed exists but is hand-carried, where there are no sewage arrangements, and where a saying is, "Lives there a man without his louse?" Nor am I concerned with the thousand and one lice-killing ointments and applications invented for prevention, nor with costly appliances and apparatuses for disinfecting, usually not available when wanted and insufficient to meet the needs when they are.

My interest has been in simple methods, available at all times and absolutely efficacious in killing body vermin, easily improvised, easily worked, and extremely effective. This interest, born of a great necessity in dealing with the appalling conditions in Serbia in 1915, has given the subject of disinfection a new importance in my eyes, and it has been my happy experience to extend that interest to conditions prevailing in Eastern war areas. The results have been from time to time officially recorded in reports submitted from the Serbian and Eastern Mediterranean war areas, where my duties for two and a half years have lain, first as O.C. of the British Military Sanitary Mission of twenty-five R.A.M.C. officers sent out to Serbia in February, 1915, and subsequently, from July, 1915, to June, 1917, as president of the Advisory Committee for Prevention of Epidemic Diseases in all the Eastern war areas.

These duties throughout have related to preventive work against infectious diseases, among which lice-borne diseases have been the most prominent and difficult. My experiences in connexion with the latter relate to the prevention and arrest of—

1. Typhus and relapsing fever in Serbia.
2. Relapsing fever in Egypt.
3. Trench fever in Macedonia.

DISINFECTION PROBLEM.

The particular problem is prevention; and, in connexion therewith, the urgent need of extended measures of disinfection against body vermin on the largest scale. As to the van disinfectors, the striking results achieved in Egypt exceed, according to the testimony of all who have seen them, in simplicity, effectiveness, and rapidity of action, ten to twentyfold any methods of disinfection ever known. They have during the past two years formed the most striking and prominent feature of preventive work in Egypt, controlling the relapsing fever which has occurred each winter amongst the native labourers, and, up to the time of my leaving in 1917, effectively checking its spread to the troops.

Typhus and Relapsing Fevers in Serbia, 1915.

The origination of the two new types of disinfectors, called the "Barrel disinfector" and the "Railway van disinfector" respectively, was the first work of the British Military Sanitary Mission. The mission was sent out by the War Office at the request of the Serbian Government, at two days' notice, under my charge, to deal with the great epidemics of typhus and relapsing fever and typhoid fever then raging in that country.

When we arrived in Salonica on March 1st, 1915, the accounts given me by the chief of the Serbian Red Cross of the conditions of that country were of the darkest character; but the realities we found after our first visits to the hospitals on our arrival at Nish on March 4th exceeded anything that had been anticipated. The whole country was decimated by these diseases, and there were over 15,000 to 20,000 cases in hospitals. There existed no available measures for disinfection and sanitation, and equipment and hospitals were lacking. The barrel disinfector was devised by my colleague Lieut.-Colonel G. F. Stammers on March 7th, 1915, three days after our arrival in Nish, and was made and put into use the following week in Kragujevatz, the head quarters of the Serbian army.

The railway van disinfector was devised by the same officer about ten days later, to meet the needs of disinfection of troops on a larger scale, and to form a part of the British sanitary train for inoculation and disinfection which we had decided to form for the work of the mission.

"VAN DISINFECTORS": THEIR NATURE AND WORKING CAPACITY.

The principle of primary importance in disinfection against lice-borne diseases is to carry out disinfection on the largest possible scale and in the shortest period of time—the object being to kill off in any individual unit within a few days every living thing in the clothes and on the body which may have possibly contracted infection and be capable of conveying such infection. This principle is carried out by the current-steam railway van disinfector with a rapidity and efficiency unapproached by any other method of disinfection.

This simple and eminently practical type of disinfector was put into use as a part of the work of the mission in Serbia. It was subsequently introduced by me (modified in certain structural details which increased its working capacity and rapidity of action) and placed at work under my direct personal supervision in Egypt in February, 1916. For the first time in the history of disinfection the van disinfectors enabled clothes to be disinfected in bundles without any need to spread them out, permitting disinfection to be carried out with the greatest ease and rapidity, on groups of 500 men at a time, and at the rate of 500 men every two hours, measured from the time of their arrival to the time of their departure. It also enabled this disinfection to be carried out every day over an area of 200 miles and more, wherever disinfection was required.

A most striking illustration of the advantages of this mobility was afforded in one instance, where a van disinfector, which had just disinfected a division of 18,000 troops in twelve days in one area, went off about 500 miles to a centre in Southern Egypt, where some cases of typhus had occurred among the native labourers. It disinfected the whole of the troops and labourers (1,500 in number) in three days, and was back at work again in its former area disinfecting another division on the fourth day.

In the first three months of their work the two van disinfectors carried out the disinfection of 170,000 kits, 170,000 overcoats, 340,000 blankets, and great masses of ordnance clothing. Since that time the disinfectors in use have been the most prominent and effective measure of preventive work in Egypt, carrying out in the simplest and most efficient way in all parts of the Egyptian war area—up to railhead in Palestine—disinfection of troops and native labourers to the number of 100,000 to 120,000 men monthly. The total number of disinfections carried out in twelve months (May, 1916, to April, 1917) among a monthly average of 40,000 labourers was 495,000—an average of over 40,000 a month.

The van disinfector, both in its principle and in its efficiency, is totally different from various contrivances which have been put into use on railways for purposes of disinfection. These latter are merely large forms of autoclaves, dependent for their efficiency on the action of steam under pressure, and therefore expensive. They are essentially "disinfectors *on* railway trucks" ("truck

* Abstract of a lecture delivered before the Royal Society of Medicine, London, on July 17th, 1918.

disinfectors "), and for disinfecting purposes they have their definite applicability and usefulness.

But for disinfection on the largest and most rapid scale, such as is required for military purposes, the usefulness and ease of working of such types of disinfectors fall far below that of the railway van disinfector. The principle of its action is quite different—namely, disinfection *by current steam*, supplied by and directly discharged in great volume and force into one or two ordinary railway vans (suitably adapted) by the railway engine which conveys them along the line to the place most conveniently adjacent to the troops. The cost of adaptation is only £30 to £40, the working simple and easy.

There is, of course, nothing new in the principle of using current steam as a disinfecting agent, but what I claim as new, and to the credit of the English Sanitary Mission in Serbia in 1915, for whose work it was first devised, is its application for widespread disinfection on a larger scale than had ever before been devised.

Method and Rapidity of Disinfecting.

Each man places his clothes in the centre of his blankets, ties the latter into a bundle by their four corners, attaches his identification disc to the bundle, and hands it into the van. Two soldiers inside the van place the bundles on the shelves and, after filling the shelves, on the gangways. One door is then closed, and the steam is turned on for a moment by the driver of the engine to enable it to be seen in what volume it is entering, what amount of steam is necessary for the particular load, and to make any final adjustment of the bundles near the doorway that may be necessary—for example, to prevent too free an escape of the steam under the door, or allow its due escape according to the degree of fullness of the van. The second door is then closed, and condensation water at once begins to escape below the doorways—at first in small amount and cool to the finger, then increasing in amount and warmth, then in about ten to fifteen minutes so hot that it cannot be borne by the finger. This continues for about half an hour; the water having a distinct offensive odour and a somewhat dirty colour. At the end of this period it becomes quite clear, loses its offensive odour, and has the clean, characteristic smell of the wash-tub. At the end of half an hour the quantity steadily lessens—an interesting change, denoting that the condensation water at first formed in the clothes is itself being converted into steam. If the van were opened at this period and any bundle taken out and examined, the clothes were found still wet with hot water. But, as the process went on, this water was itself converted into steam, till eventually, when the operation was complete at the end of an hour, the clothes were found full of steam at a temperature of 100° to 105° C. On being shaken in the air, this rapidly evaporated, leaving the clothes dry in a minute or two.

Working Capacity.

Each double van is capable, if fully employed, of carrying out disinfections at the rate of 500 kits with 1,000 blankets and 500 overcoats every two hours, of over 10,000 kits with 20,000 blankets and 10,000 overcoats in four days, and 18,000 kits with 36,000 blankets and 18,000 overcoats in nine days. With one disinfector alone I have disinfected the kits and blankets of a hospital with 1,000 beds in four hours; the kits, blankets, and camp bedding of 4,000 prisoners of war in sixteen hours; of 1,500 camel corps men in about twelve to eighteen hours.

Relapsing Fever in Egypt.

The van disinfector system was introduced into Egypt in February, 1916, for the control of relapsing fever. In Fig. 1

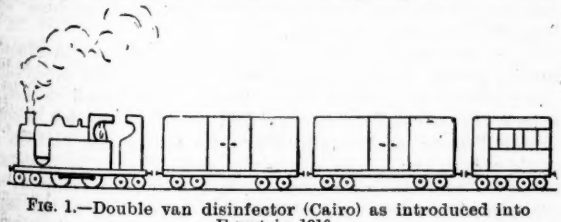


FIG. 1.—Double van disinfector (Cairo) as introduced into Egypt in 1916.

is shown a van disinfector made in the railway works at Cairo from a steel van and old engine which were available. It included certain modifications, in the larger size and more central position of the steam pipes, the large number (a double row) of minute apertures, $\frac{1}{8}$ inch in diameter, for the dispersion of the steam from the engine instead of a few larger apertures, and in the substitution of shelves for the clothes, instead of wooden bars or hooks for hanging the clothes. The adaptations were made in four days, at a cost of £35. The modifications made in this van disinfector included the use of a small railway engine for the combined purpose of locomotion and production of steam, instead of a small heating engine. This added enormously to the rapidity and efficiency of action, as was proved by numerous tests I made—eggs being boiled hard, potatoes cooked, cultures sterilized, flies enclosed in test tubes killed, and, most conclusive of all, a self-registering thermometer, even when enclosed in its case, closed in at both ends and put into the centre of the largest bundle, registered temperatures of 102° to 105° C. (215° to 220° F.), as early as half an hour after the steam was turned on from the engine into the van. In each and every direction the results obtained exceeded all previous experiences or expectations connected with the possible usefulness of this type of disinfector.

Factors in the Disinfecting Process.

The factors concerned in the remarkable disinfecting powers which this disinfector has proved itself to possess are the following:

1. The first and most important and essential factor at work in the van is the disinfecting power of current steam (steam in continuous motion) at the ordinary atmospheric pressure. It is at once the easiest and the most potent disinfecting factor we possess.

2. The second factor is the great force under which the steam is driven into the van and clothes—a force derived from a pressure of 4 to 7 atmospheres (60 to 110 lb.) in the boiler of the engine. This is a powerfully aiding factor, which enables the steam to penetrate even the largest bundles of clothes. No attempt is made to develop any pressure in the van itself.

3. The third factor is the great volume of steam available from the boiler of a moderate-sized or even small engine, a factor which also contributes to the rapid penetration into the clothing.

The above factors would be amply sufficient of themselves for all purposes.

But they are powerfully aided by another very interesting and important factor connected with temperature. This is the possible action of the extra heat or "heat of condensation" of steam which has been under a pressure of 4 to 7 atmospheres, and which has just been set free from that pressure on entering the van. This heat is considerable. In the locomotive used by me the pressure in the boiler varied from 60 to 110 lb. (4 to 7 atmospheres). Steam under this pressure attains a temperature of 144° C. or 168° C. Immediately on entering the van the steam comes under normal atmospheric pressure, falling therefore to 100° C. and parting at once with its increased heat of 44° C. or 68° C. This "heat of condensation" is available as a factor, and appears to be an important factor in raising—in a few minutes—the temperature of the van to that of 105° C., which is so constantly found.

This source of additional heat ("heat of condensation") continues throughout the whole period of disinfection. It affects in the first place the articles it first strikes, and on which its full effect can be most rapidly manifested—namely, the walls of the van. Nothing was more striking from the first than the rapidity (five to ten minutes) with which the walls of the steel van became burning hot. But its action rapidly extends to all the clothes, and, thanks to the great force and volume of the steam, it rapidly penetrates to the centre of even the largest bundles, raising the temperature there to 102° to 105° C., as I found time after time by enclosing a thermometer in the centre of such bundles.

It might at first sight seem that to produce a temperature of 105° C. there must be pressure in the van, but no attempt is made to develop any pressure, the steam being allowed to escape above and below and around the doorways and in any other place (for example, chinks in the floor or in the roof) through which it can escape. Indeed, so far from trying to produce pressure, I always made it a point, in packing the van cram full, as I frequently did, to see that the bundles of clothes near the foot of the doorways did not obstruct the exit of the steam;

and I always made a point of regulating the amount of steam used, keeping it just sufficient to cause a sufficient but not excessive escape of steam from the van.

The Factor of Pressure.

Although no attempt is made to develop pressure in the van, there is the possibility that the walls of the steel van with the mass of clothes in it might exert a certain degree of pressure upon the contained steam. The temperature reaching 105° C. denotes a pressure of about 24 lb. (or about 9 lb. above ordinary atmospheric pressure).

The question at issue is one of physics, with which I do not feel qualified to deal. In favour of the view that increased pressure may be responsible for at least some part of the rise (of 5° C.) I can mention one fact of interest, namely, that in Stammers's barrel disinfector, described below, the temperature rapidly rises to 100° C. and in some circumstances may reach even 102° C. On the other hand, against this view of pressure is the result of one experiment in which there seemed to be no time for pressure to develop; and yet the temperature reached 102° C. in a few minutes.

The practical point is that, whether due to "heat of condensation," or to pressure, or to both combined, the temperature in the van disinfector (Cairo) did reach 105° C. The increase of temperature must contribute to the rapidity of the disinfecting process, if only by ensuring that the temperature rapidly rises to and never falls below 100° C.

The great advantage is not that there is any necessity for such a temperature for killing lice or their nits, which can be killed by temperatures far lower, but that the whole of the watery vapour in the clothes is in the form of steam at the end of the process, that the clothes are not wet with warm water but moist with steam, and that, consequently, if exposed at once to the air the clothes become dry in a minute or two. This occurs also with the "barrel disinfector." The method is pre-eminently suited for military purposes against all lice-borne diseases, such as trench fever, typhus, and relapsing fever, and against other verminous diseases like scabies, in which the needs are not for periodic disinfection on a small scale, but disinfections on large bodies of troops, carried out frequently and rapidly within a few days whenever the opportunity presents.

LICE-BORNE INFECTION AMONG TROOPS IN THE FIELD.

It is clear from the foregoing that to deal effectively with such conditions the disinfection must be capable of being brought to the troops, so as to be accessible to them wherever they are; it must be capable of dealing with them rapidly and in great numbers at a time, in order to interfere as little as possible with military duties, and be easily improvised on the spot and capable of being easily and expeditiously worked without need of special knowledge or technique or special personnel.

All these requirements are in my experience met—in a manner unapproached by any other type of disinfector—by the van disinfector (Cairo). Looking back at the circumstances in the Egyptian war area and on the results which I closely followed for a year and a half, I feel satisfied that in the absence of this form of disinfector the problem of relapsing fever in the Egyptian war area would have occasioned the greatest military difficulty and greatly impeded the successful prosecution of the campaign. Before the introduction of the van disinfectors among the natives nearly one-fifth of the average number of labourers were attacked by relapsing fever, but by disinfection on the largest scale by this disinfector the disease was effectively arrested or stamped out.

REGIMENTAL DISINFECTION BY MEANS OF STAMMERS'S "BARREL DISINFECTORS."

While the "Railway van disinfector" meets in most effective way the needs for disinfection of large bodies of troops or ordnance clothing, the needs for regimental disinfection are in my experience most simply and effectively met by the "Wine-barrel disinfector"—happily devised by Lieut.-Colonel Stammers as the first measure of disinfection against typhus and relapsing fever in Serbia.

Originally known as the "English barrel disinfector" during our work in Serbia, it was subsequently introduced as the simplest form of disinfection amongst our troops in Mudros, Gallipoli, in the autumn of 1915, and in the Salonica forces early in 1916, where Lieut.-Colonel Stammers was A.D.M.S. (Sanitary). It was introduced into Egypt and thoroughly tested by me in October, 1915, when in Cairo.

Description of Barrel Disinfectors.

An old wine-barrel is taken and in its bottom a large central hole is made, with five or six holes around it; through them the steam enters the barrel, which stands (Fig. 2) on a circular boiler of cast iron or galvanized iron. To prevent any escape of the steam between the boiler and the bottom of the barrel a narrow sausage ring, filled with sand, is placed between the boiler and the barrel. The weight of the barrel presses this down, forming an efficient valve.

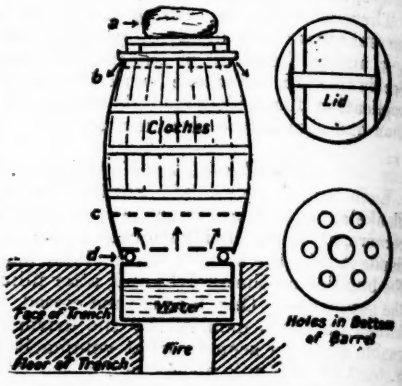


FIG. 2.—Stammers's "barrel disinfector."

To keep the clothes in the barrel away from the holes in the bottom through which the steam enters a small frame made of two or three crossed bars of thin wood or wicker-work is placed inside the barrel, over and about 9 inches above the holes.

The barrel is provided with a wooden lid, purposely made heavy, with an edge which fits inside the barrel or overlaps it. The object of the lid is not to prevent but to retard the escape of the steam; the purpose of the disinfector is disinfection by current steam which escapes slowly and with some difficulty around the edges of the lid. For transport the boiler and its sausage ring of sand are placed inside the barrel. Each barrel disinfector should have its own fire; once the water is heated, a very low fire suffices to keep it boiling. Each company of 250 men should have its own barrel disinfector, under the charge of the N.C.O. responsible for seeing that the men of his company are kept free from lice.

After the barrel is thoroughly heated and the steam escaping is too hot to be borne by the hand, the time required for disinfection of clothing is one hour; when fully heated up the temperature can reach as high as 100° C. (212° F.).

In view of the widespread infection underlying trench fever, and its proved connexion with lousiness, the two methods here described are those most easily adapted for troops. I can confidently recommend them for wide use supplementary to or in place of any of the many other measures of disinfection or form of disinfectors now in use.

They have been tried on a scale in Serbia and in Egypt to deal with conditions of infection such as have never been exceeded in any war, and with success exactly proportionate to their systematic and continued use.

The area where the problem is now presented and the disease, trench fever, is different, but the problem is the same, and is capable of solution by the same methods—namely, not by methods requiring costly apparatus and technical skill for their use, but by practicable measures available and utilizable by the men themselves and by the company officers responsible for their cleanliness and freedom from lice infection.

The prevention of lice-borne disease can never be effected by the costly appliances of autoclave nature any more than the face cleanliness of troops could be effected or maintained by periodic visits to baths. The matter is one which affects each company of men and the platoon of each company; given a simple appliance it is perfectly possible, as my experience shows, for each company or platoon officer to keep his men free from lice or at least to give his men the opportunity of freeing themselves from lice at short periodic intervals when at rest in reserve.

For this purpose all that is required is the use of a simple steam disinfector of the nature of the barrel

disinfector, which can be improvised at a cost of a few shillings, or of an even simpler form of steam disinfector of the same principle which we also introduced into use and employed in Serbia—namely, a galvanized sanitary bin (Fig. 3), placed over a fire, with a foot of water at the bottom, and an open wire or wooden grid over the water to keep the clothes off the water; one such barrel disinfector or bin disinfector for each company could meet its need of disinfection against lice to a degree which would reduce to one-tenth, even if it failed to eliminate, the entire risk of infection from louse-borne diseases.

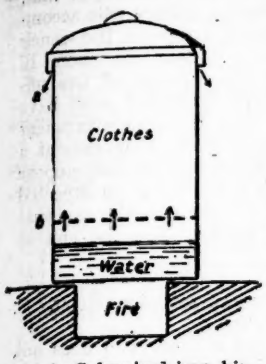


Fig. 3.—Galvanized iron bin disinfector.

Speaking from experience, were I a commanding officer of a regiment, I would rather for immediate practical purposes have four such barrel disinfectors at my disposal (and, failing that, I should improvise them) than any type of disinfector—"portable" or otherwise—that I have seen.

THE KING'S LETTER.

In the letter congratulating Sir Douglas Haig and the troops that have fought so magnificently, on the happy results obtained, addressed to Field Marshal Sir Douglas Haig by the King at the conclusion of his visit to the army in France at the beginning of the fifth year of war, His Majesty said, "Of the hospitals, their efficiency, skill, devotion, and untiring efforts of the staff, I cannot speak in too high praise."

CASUALTIES IN THE MEDICAL SERVICES.

ROYAL NAVY.

Accidentally Killed.

Surgeon L. A. Martin, R.N.

Surgeon Lionel Arthur Martin, R.N., was accidentally killed at sea on August 10th, aged 31. He was the youngest son of Dr. E. F. Martin of Weston-super-Mare, and was educated at University College Hospital, taking the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1912. He joined the navy as a temporary surgeon on August 6th, 1914, two days after war was declared.

ARMY.

Killed in Action.

Lieut.-Colonel A. J. A. Menzies, D.S.O., R.A.M.C.

Lieut.-Colonel Arthur John Alexander Menzies, D.S.O., R.A.M.C., was killed in action on August 9th, aged 32. He was the only son of the late Alex. Menzies of Lankat Estate, Sumatra, and was educated at Edinburgh University, where he graduated M.B. and Ch.B. in 1912. He entered the R.A.M.C. as lieutenant on January 30th, 1914, was promoted to captain on March 30th, 1915, and had since been promoted to an acting lieutenant-colonelcy. He gained the D.S.O. in 1915 at Loos. He had been in France from October 7th, 1914, till his death, when he was in command of a cavalry field ambulance.

Captain G. H. H. Almond, R.A.M.C.

Captain George Hely Hutchinson Almond, R.A.M.C., was killed in action on August 9th, aged 41. He was the eldest son of the late Hely Hutchinson Almond, head master of Loretto School, and was educated at Loretto, at St. Bartholomew's Hospital, and at Oxford, where he graduated B.A., with honours in natural science, in 1902, and M.A., M.B., and B.Ch. in 1908, also taking the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1906. After filling the posts of clinical assistant in the electrical department and of house-physician at St. Bartholomew's, and of house-surgeon at the West London Hospital, he went into practice at Bath, where he was honorary pathologist to the Royal Mineral Water Hospital, assistant pathologist to the Royal United Hospital, medical officer of Monckton Combe School, and District Director of the Clutton Division of the Red Cross Society. He served in the South African war as a combatant, and had the Queen's medal with two clasps. He took a temporary commission in the R.A.M.C. in 1915, was promoted to captain after a year's service, and had been serving as a pathologist at the front. His two brothers had previously fallen in the war, Captain R. L. Almond, R.E., in 1914, and Lieutenant H. T. Almond, Gordon Highlanders, in 1916. In 1908 he married a niece of the late Sir William MacCormac, Bt., and leaves a widow and three sons.

Captain W. H. Lister, D.S.O., M.C., R.A.M.C.

Captain William Howard Lister, D.S.O., M.C., R.A.M.C., was killed in action in Italy on August 9th. He was educated at University College and Hospital, London, and took the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1913, after which he filled the posts of surgeon to the Royal Mail ss. *Cobequid*, and of house-physician at University College Hospital. While still a student he served as a dresser under the Red Cross with the Greek army in the Balkan war of 1912. He took a temporary commission as lieutenant in the R.A.M.C. on August 8th, 1914, and was promoted to captain on completion of a year's service. In 1915 he was severely wounded. He received the Military Cross on June 3rd, 1915; a bar thereto on October 20th, 1916; a second bar on November 25th, 1916; and the D.S.O. on December 17th, 1917.

Died of Wounds.

Captains M. A. McKechnie and T. Whitmore, both of the Canadian Army Medical Corps, were reported as having died of wounds, in the casualty list published on August 17th.

Died on Service.

Captain J. Cross, R.A.M.C.

Captain John Cross, R.A.M.C., died at Allahabad on July 21st. He was educated at Glasgow University, where he graduated M.B. and Ch.B. in 1903, and, after acting as house-physician and house-surgeon of the Victoria Infirmary, Glasgow, went into practice at Birkenhead. He took a temporary commission as lieutenant in the R.A.M.C. on June 14th, 1917, and was promoted to captain after a year's service.

Wounded.

Lieut.-Colonel D. Donald, Canadian A.M.C.
Major J. Hughston, R.A.M.C. (temporary).
Captain J. D. H. W. Barnett, Canadian A.M.C.
Captain I. M. Barrow, Australian A.M.C.
Captain D. St. C. Campbell, Canadian A.M.C.
Captain E. A. McCusker, Canadian A.M.C.
Captain D. R. Morrison, Canadian A.M.C.
Captain A. J. W. Ritchie, R.A.M.C. (temporary).
Lieutenant J. J. Hughes, R.A.M.C. (temporary).
Lieutenant J. J. Pickles, R.A.M.C. (temporary).

Prisoners of War.

Lieut.-Colonel A. C. H. Gray, R.A.M.C.
Captain F. C. H. Bennett, R.A.M.C. (temporary).
Captain M. S. Esler, R.A.M.C. (temporary).
Captain D. D. Gillespie, R.A.M.C. (temporary).
Captain R. M. Handfield-Jones, R.A.M.C. (temporary).
Lieutenant A. Boyle, R.A.M.C. (temporary).
Lieutenant J. W. Jones, R.A.M.C. (temporary).
Lieutenant A. M. McDonnell, R.A.M.C. (temporary).

In the British Medical Journal of August 17th, the name of Major G. Stiell, R.A.M.C., was entered by mistake in the list of prisoners, instead of in that of wounded.

Deaths of Sons of Medical Men.

Collyns, Robert Henry, M.C., acting Major Royal Engineers, second son of Dr. Collyns of Dulverton, died of wounds in hospital abroad on June 1st, aged 23.

Keith, Thomas Stotherd, Cameron Highlanders, youngest son of the late Dr. Keith of Aboyne, killed in action, July 24th, aged 31.

Ogilvy-Ramsay, Max, Second Lieutenant Royal Air Force, only son of the late Maxwell Ogilvy-Ramsay, surgeon, of Carlisle, died of wounds recently, aged 20.

Young, William Barrie, Captain Royal Air Force, only son of Dr. Young of Earlston, Berwickshire, accidentally killed on August 8th while flying in the South of England. He was educated at Edinburgh Academy, and at the beginning of the war enlisted in a Scottish yeomanry regiment, with which he served in Salonica. After obtaining a commission in the R.A.F. he was severely wounded in an air fight in France in 1916. He was serving as an instructor in England at the time of his death.

[We shall be indebted to relatives of those who are killed in action or die in the war for information which will enable us to make these notes as complete and accurate as possible.]

HONOURS.

THE following are the acts of "conspicuous gallantry and devotion to duty" for which the decorations announced in our issue of March 9th, 1918, p. 299, were awarded to the two medical officers mentioned:

Bar to the Military Cross.

Temporary Captain George Lestock Thornton, M.C., R.A.M.C.

After his two orderlies had been killed he continued to attend to the wounded with complete disregard for his personal safety.

Military Cross.

Temporary Captain Robert Daniels Bell, R.A.M.C.

On the battery positions being heavily shelled with gas shells one shell struck a dug-out occupied by three men, badly wounding two of them and gassing the third. This officer immediately proceeded to their assistance, extricated them from the débris, and proceeded to bind up their wounds, removing his own gas mask in order to see more clearly. The men were successfully evacuated to a dressing station, but he, unable to find his mask, became badly gassed. Despite this, he persisted in carrying out his duties for some time until he had to be evacuated. His absolute lack of fear was undoubtedly the means of saving the lives of the three men.

OFFICERS COMMENDED.

The following members of the medical profession are included in a list of names brought to the notice of the Secretary of State for War for valuable services rendered in connexion with the war:

Major-Generals: Sir W. Donovan, K.C.B., A.M.S., O. R. A. Julian, C.B., C.M.G., A.M.S.

Surgeon-General W. S. M. Price, A.M.S.

Colonels S. H. McKee, C.M.G., C.A.M.C., W. H. Parkes, N.Z.M.C.

Lieut.-Colonels: H. H. Balfour, M.B.E., S.A.M.C. (temporary Major R.A.M.C.), H. J. Barnes, R.P., late R.A.M.C., U. J. Bourke, R.A.M.C., E. R. W. Carroll, I.M.S., R.P., W. H. Delaney, C.A.M.C., C. E. Dennis, A.A.M.C., P. G. Goldsmith, C.A.M.C., (temporary Colonel) C. T. Green, T.D., R.A.M.C.(T.F.), W. E Grigor, A.A.M.C., Acting Colonel L. E. W. Irving, D.S.O., C.A.M.C., W. J. Le H. Lyster, United States M.C., F. Marshall, A.A.M.C., H. M. Nicholls, R.A.M.C., K. D. Panton, C A.M.C., W. F. Somerville, M.D., T.D., R.A.M.C.(T.F.), B. M. Sutherland, A.A.M.C., J. R. Yourdi, R.A.M.C., R.P.

Temporary Lieut.-Colonel H. French, R.A.M.C.

Majors: (Temporary Lieut.-Colonel) J. K. Adey, A.A.M.C., S. C. Chown, C.A.M.C., H. A. Howes, R.A.M.C.(T.F.), T. R. Ritchie, N.Z.M.C., A. C. Stamberg, Jersey Medical Corps (temporary Major R.A.M.C.), H. H. D. Turnbull, A.A.M.C., C. B. Turner, R.A.M C.(T.F.), G. C. Willcocks, M.C., A.A.M.C., C. A. Young, C.A.M.C.

Temporary Majors R.A.M.C.: F. S. Brereton, W. B. Cosens, G. P. Humphery, W. V. Robinson, R. Wilson, S. W. Woollett. Temporary Major J. C. A. Rigby, S.A M.C.

Temporary honorary Major T. G. M. Hine, R.A.M.C.

Captains R.A.M.C.: G. A. Child (T.F.), R. A. Freeman (T.F.), L. C. Hayes, (temporary Lieut.-Colonel) E. A. Houchin (T.F.), (acting Major) A. Jackson, G. E. Kinnersley, W. P. MacArthur, D.S.O., (local Major) A T. J. McCreery, M.C., G. W. S. Paterson, T. Sheedy (S.R.), C. W. Wirgman (T.F.). Captains C.A.M.C.: (Acting Major) J. R. Goodall, E. L. Warner, C. R. Wilson. Captain (temporary Major) H. O. Lethbridge, A.A.M.C. Captains N.Z.M.C.: (Temporary Major) W. Bruce, D. E. Fenwick, W. S. Wallis.

Temporary Captains R.A.M.C.: D. J. Bedford, A. E. Boycott, R. Bruce-Low, W. A. Clayton, F. Corner, S. E. Denyer, C.M.G., J. Fairley, E. F. W. Mackenzie, D. W. Maclagan, J. A. Marsden, R. A. Peters, M.C., (temporary Major) H. T. L. Roberts, T. Russell.

Dr. A. M. Roberts, Medical Recruiting Controller, Q.M.A.A.C.

The list also includes a number of warrant and non-commissioned officers and men of the R.A.M.C. and colonial medical corps.

FOREIGN DECORATIONS.

The President of the French Republic has conferred the honours indicated upon the following officers of the R.A.M.C.:

Legion D'Honneur.—Croix d'Officier: Colonel Claud K. Morgan, C.M.G.

Croix de Guerre.—Major Charles M. Row, Captain Francis Ward, temporary Captain Cecil T. I. Clarke.

The British member of the Royal Italian Medical Commission upon whom the King of Italy conferred the rank of Cavalier of the Crown of Italy, noted last week, p. 173, as Dr. Andrew Morton, is Mr. A. Stanford Morton, F.R.C.S., ophthalmic surgeon to the Italian Hospital.

NOTES.

"THE BLACKGUARD NATION."

THE German army, which we are often told is one with the German people, is filling up the cup of its iniquities. When the Germans bombed hospitals the excuse was made for them that the buildings were not properly marked with the Red Cross, though the apologists forgot to add that the Germans used the Red Cross to protect their corps head quarters. A month or two ago an order was found to have been issued directing troops in the advanced line to shoot down stretcher parties collecting the wounded, not so much with the object of killing them, but, as was explained, to ensure that the wounded were left out so long that they would be beyond the reach of the surgeon's art. In this way it was sought to diminish allied effectives. The Ministry of Information has now sent through its wireless service particulars of certain gross outrages committed by the Germans upon British prisoners and wounded in March last. The stories have no doubt been seen by all readers, and it is only necessary to say that the sworn statements of soldiers belonging to a Scottish regiment are to the effect that, under the orders of a German officer, a soldier who accompanied him turned a stream of liquid fire down the trench in which prisoners and wounded (16 men, of whom 10 were wounded) had been lined up. Some of the unwounded men escaped, but all the wounded must have been either suffocated or burnt. The British Government has caused to be conveyed to the German Government a protest against the offences described, but, as they appear to be part of a deliberate policy, it is hardly to be expected to have any effect. The *Cologne Gazette* recently said that the Germans are a blackguard nation, and the epithet seems well chosen.

THE WEIGHT OF LIMBS: NATURAL AND ARTIFICIAL LIMBS COMPARED.

It happens not infrequently that a man who does not find it easy to manage an artificial limb believes that his difficulty is due to the weight of the appliance. At the instance of Colonel J. Lynn Thomas, C.B., C.M.G., Surgeon to the Prince of Wales's Hospital for Limbless Sailors and Soldiers at Cardiff, Professor A. Keith, F.R.S., Conservator of the Museum of the Royal College of Surgeons of England, has supplied some information which has been printed on a card at the Welsh Orthopaedic Centre Curative Print Shop.

The information supplied by Professor Keith is as follows:

The total weight of a lower extremity is 18.6 per cent. of the body weight, and the total weight of an upper extremity 6.38 per cent. of the body weight. In a man weighing 11 stone (154 lb.), a lower extremity would weigh 28.65 lb., made up thus:

Thigh	...	11.6	per cent. of body weight	=	17.85 lb.
Leg	...	5.2	,, ,, ,,	=	8.0 ,,
Foot	...	1.8	,, ,, ,,	=	2.8 ,,
		18.6	per cent. of body weight	=	28.65 lb.

An upper extremity would weigh 9.8 lb., made up thus:

Upper arm	...	3.3	per cent. of body weight	=	5.1 lb.
Fore arm	...	2.28	,, ,, ,,	=	3.5 ,,
Hand	...	0.8	,, ,, ,,	=	1.2 ,,
		6.38	per cent. of body weight	=	9.8 lb.

For comparison Colonel Lynn Thomas has supplied us with the weights of the standardized artificial limbs made for the patients at the Prince of Wales's Hospital, Cardiff:

Lower Limb.

For disarticulation at the hip (including tilting table)	9 lb.
For amputation through the upper thigh (with pelvic band)...	7¼ ,,
For amputation through the middle thigh ...	6½ ,,
For amputation through the knee	6 ,,
For amputation below the knee	5¾ ,,
For Syme's amputation	3½ ,,

Upper Limb.

For disarticulation at the shoulder ...	3 lb. 10½ oz.
For amputation above elbow	2 ,, 12½ ,,
For amputation below elbow	2 ,, 4½ ,,
For amputation of the hand	7½ ,,

MILITARY MEDICAL ESTABLISHMENTS IN ITALY.

According to the *Giornale d'Italia* of July 10th, there were in Italy before the war 28 principal and 2 auxiliary military hospitals, 6 convalescent depôts, and 31 garrison infirmaries. In September, 1917, there were 948 reserve hospitals, 21 convalescent institutions, 146 Red Cross hospitals, and 1 hospital of the Order of Malta, with a total number of several hundred thousand beds. The sanitary services of the army included bacteriological and disinfecting stations, close up to the front lines; consultation posts, each with a surgeon, an ophthalmologist, a syphilographer, a psychiatrist, a neuropathologist, and a stomatologist chosen from among university teachers; hospital trains, trains for stores and equipment, stretcher sledges, motor litters, and ambulances; physiotherapeutic centres for each army corps; departments of confirmatory diagnosis for incipient tuberculosis; a centre at Nervi for tuberculous prisoners, and one at Careggi, near Florence, for tuberculous men from the war zone; surgical sections at Turin, Milan, Genoa, Bologna, Florence, Rome, Naples, and Palermo for blinded and mutilated soldiers; neurological centres for each army corps; departments and special hospitals in each army corps for relapsing malarious patients; antimalarial sanatoriums for convalescents; and surgical and radiological ambulances for each army corps.

Scotland.

THE SCOTTISH UNIVERSITY CONSTITUENCY.

AT a meeting of the Labour Representative Committee of the Scottish Universities in Glasgow on August 17th, at which graduates belonging to the professions of medicine, teaching, the ministry, law, and engineering, were present, Dr. Peter Macdonald and Dr. James Dunlop were chosen as candidates for the parliamentary representation of the Scottish Universities. Dr. Peter Macdonald, whose first medical degree at Aberdeen was taken in 1894, is surgeon to the ear, nose, and throat department of the York County Hospital. He is at present one of the vice-presidents of the Panel Médico-Political Union. Dr. James Dunlop, who graduated M.B., Ch.B. in 1910, practises at Shettleston, an eastern suburb of Glasgow. Colonel W. R. Smith, who is a graduate of Aberdeen University, and has recently been elected a sheriff of the City of London, has also been invited to become a candidate; it was announced some time ago that Sir John Collie had been invited to become a Liberal candidate for the Scottish Universities, and other names also have been mentioned. The sitting members are Sir Watson Cheyne (Edinburgh and St. Andrews) and Sir Henry Craik (Glasgow and Aberdeen). Although we have seen no definite statement on the subject, we understand that both are prepared to stand again.

STERILIZATION OF MEAT FROM TUBERCULOUS ANIMALS.

IT appears that by direction of Mr. Trotter, the chief veterinary meat inspector, a quantity of tuberculous meat has been put into cold storage in Glasgow. The storage appears to have been connected with an attempt to introduce into the city a system of sterilizing meat condemned as tuberculous. The Health Committee, after two discussions, has referred the matter to the subcommittee on meat and fish inspection to investigate and report. The sale of sterilized meat from tuberculous animals has long been permitted in Berlin and, we believe, in other German cities.

Canada.

CONTROL OF VENEREAL DISEASES.

THIS year the Canadian Medical Association, the Ontario Medical Association, the Canadian Association for the Prevention of Tuberculosis, and the Ontario Health Officers' Association, met at the same time at Hamilton, on Lake Ontario.

The first two days of the medical week were devoted to meetings of the Canadian Public Health Association and the Ontario Health Officers' Association. The opening ceremony was performed by the Duke of Devonshire, the Governor-General. The principal questions under discussion were the control of venereal diseases and the conservation of child life. Lieut.-Colonel John W. S. McCullough, Chief Health Officer for the Province of Ontario, gave an account of the Act recently passed by the Legislature of Ontario. It provides that any person under arrest may, if thought necessary by the health officer, be examined to discover if he is suffering from venereal disease, and, if so, detained and treated. Medical officers in charge of places of detention are required to report cases within twenty-four hours. Medical officers of health may also require examination and treatment of persons they know to be suffering from venereal disease, and provision is made for the right of entry in the daytime by the health officer or his deputy to premises for the purpose of examining persons known to be so infected. It is provided that action against a physician making examination or reports with regard to such cases can be brought only with the consent of the Board of Health. It is provided also that hospitals receiving Government aid shall arrange for the treatment of cases of venereal disease, and that the necessary remedies and equipment for treatment shall be supplied free to hospitals. Heavy penalties are imposed on any persons other than qualified physicians who attend or treat venereally infected persons, on those who advertise remedies, and on those found guilty of infecting others.

The presidential address of the Canadian Medical Association was given to a combined general session of all the associations by Dr. H. Beaumont Small of Ottawa. In it Dr. Small made reference to the spirit of amicable co-operation manifested both before and at the congress, and expressed the hope that on account of the scientific programme presented the departure would commend itself to the profession, and that the precedent established of one medical congress instead of several medical meetings would occasionally be followed.

We learn that an Act is now in force in Saskatchewan which provides that all cases of syphilis, gonorrhoea, or chancroid shall be reported by the physician in attendance to the Commissioner of Health. The physician is required to furnish particulars as to the age of the patient, his occupation, marital relations, and probable source of infection. Such information will not be made accessible to the general public, and the name of the patient will not be given unless he fails to return for treatment for thirty days, in which case his name and address must be reported to the Health Commissioner, who is authorized to take the necessary steps to ensure that such patient receives adequate treatment. Provision has been made for the treatment of patients suffering from these diseases and for the carrying out of the Wassermann test at the new pathological laboratory at the Regina General Hospital and at the chemical laboratory of the University of Saskatchewan at Saskatoon. An educational campaign throughout the province has been begun to awaken the public to the dangers from these diseases.

Correspondence.

THE LABOUR PARTY AND THE MEDICAL PROFESSION.

SIR,—It is gratifying to read Mr. Sidney Webb's admirable letter, and not only to be assured that the Labour party is not in favour of a State medical service, but also to observe how closely he, as spokesman for his party on this occasion, is in agreement with the scheme approved by the Council of the Association, and set out in the pamphlet under the title of *A Ministry of Health*. It is unfortunate that there are a number of members of the Labour party, both medical and lay, who do not agree with us, but it is clear that we may now look for help from representatives of all the political parties in achieving the main objects to which we have set our hands in this matter.

There are three main points as to which I should like to compare Mr. Webb's statements with those set out by the Council. Mr. Webb does not favour a "State army of salaried clinicians operating, like the R.A.M.C., from a central head quarters and working in conjunction with an array of State hospitals and sanatoriums administered, like the pensions, by a Government department at Whitehall." We entirely agree, of course, but I should like to assure Mr. Webb that we are equally opposed to the establishment of such a "State army of salaried clinicians," even though its divisions or regiments may be administered by local councils. It is the whole-time salaried clinical service, whether centrally administered or otherwise, that we believe to be not good for the profession and bad for the public. I hope Mr. Webb agrees.

The three local bodies administering health services are: the Poor Law guardians, the Insurance Committee, and the Municipality or County Council (including the Education Committee). Mr. Webb, we know, is foremost among those who advocate the abolition of the first of these, and the handing over of its medical functions to others. Again we entirely agree, and as the Poor Law administration seems to be the chief obstacle to immediate progress, it is important that all those who take this view should unite their efforts to remove it. But with regard to the second and third, Mr. Webb seems to contemplate their continued separate existence and development, mitigated by an attempt to co-ordinate their work so that they may aid one another. Our scheme, on the contrary, aims at their complete unification, and attempts, in unifying them, to preserve the best features of both. Perhaps Mr. Webb might agree that the latter plan is better than the former, but prefers co ordination to unification as being easier of accomplishment. If this be so, I suggest that where both

plans are difficult it is as well to aim at the complete one, and I plead for his help and that of his party.

Mr. Webb frankly recognizes the need for "the full and cordial co-operation of the independent medical practitioner," and states that the Labour party are basing their scheme on "a more effective representation in the counsels of the nation of the medical profession itself; meaning by this the opinion of the general practitioner even more than that of the consultant, the official expert, or the professor of the medical college." Again we entirely agree, and our scheme attempts to secure this in three ways—(1) by a completely independent department for medical research and statistics; (2) by "an Advisory Medical Council attached to the Ministry of Health without executive powers, but authorized to report to the public, uncensored by the Government, upon anything done or undone in the realm of public health"; (3) by a local medical committee elected by all members of the profession in each area exercising locally powers similar to those which the Advisory Council exercises centrally. Mr. Webb does not refer to the first of these, but there is no reason to suppose that it is objected to. The other two, of vital importance to the profession, he somewhat emphatically adopts. The second I have described in his own words; the third he implies is a suggestion of his party's, going beyond our own, but I invite his attention to the fact that it is set out quite clearly in our scheme, and that we are in agreement as to its value and importance.

Where so much that is basic is agreed upon we need not despair of carrying Mr. Webb and the Labour party with us the whole way, and so securing among all political parties a general agreement that will be sufficient to overcome the smaller interests and jealousies that are bound to be in opposition.—I am, etc.,

London, N., Aug. 18th. HENRY B. BRACKENBURY.

SIR,—Mr. Sidney Webb's letter in the BRITISH MEDICAL JOURNAL of August 17th should prove of great interest, whatever the political views we hold. Mr. Webb voices, if he does not dictate, the ideals in health measures of an important section of what is called "Labour." From his letter it appears that most of us have hitherto misunderstood these ideals. And he desires a "more effective representation in the counsels of the nation of the medical profession itself." In fact, Mr. Webb would concede to the doctor an extremely important position in the State.

Without discussing in detail the aims stated by Mr. Webb, I would like to indicate briefly the specific matters which, in my opinion, need consideration forthwith by all those who are interested in "reconstruction" so far as it affects the medical profession, whether they are members of the lay community, or of the medical profession, or of the State services. It seems to me that without due consideration and right decision on these matters no sound foundations for a Ministry of Health can be laid. First, there is the better education of the medical man, whether as a student or when qualified. With regard to the education of the student, there is much food for thought in Sir George Newman's *Notes on Medical Education in England*. For the continued education of the qualified practitioner—an even more difficult matter—it is worth considering how far a closer linking up of the general practitioner and the consultant or specialist can be effected. Such linking might lead to better continuity of treatment and to a physiological division of labour, as well as having an educational value for all concerned. In order not to interfere with the student-teaching functions of the larger hospitals, use should be made of such institutions as special hospitals, Poor Law infirmaries, and fever hospitals, which might be thrown open to the general practitioner.

Secondly, so far as the industrial population is concerned, more time would seem to be required for diagnosis and treatment. This may mean that a larger number of entrants to the profession of medicine is needed; and if so, the nature of greater inducements which should be held out, and their development, must be considered.

Thirdly, methods of providing greater facilities for special methods of investigation in the treatment and diagnosis of disease must be found.

Finally, on these foundations it may be possible to build a Ministry of Health from which real benefit might accrue. As to the form which that Ministry should assume opinions still seem divided. May it not be possible that greater results will be obtained from a super-department engaged in scientific research into the principles upon which public health should be based, rather than from a conglomeration of the present departments concerned with public health engaged in attempting to administer an unwieldy machine?—I am, etc.,

London, W., Aug. 20th. CHARLES BUTTAR.

VANGHETTI'S OPERATION.

SIR,—My attention has been drawn to a letter in your issue of August 3rd signed by Colonel Openshaw and Colonel Lynn Thomas. I wish to state that the operation which they criticize was only performed after the case had been seen in consultation according to the invariable rule of the hospital. And, in fact, it was at the express wish of the surgeon in charge that I did the amputation.—I am, etc.,

London, W., Aug. 14th. ERIC PEARCE GOULD.

THE MENINGOCOCCUS OF WEICHSELBAUM.

SIR,—The article by Dr. Edward C. Hort in the BRITISH MEDICAL JOURNAL of September 22nd, 1917, on the Meningococcus of Weichselbaum is somewhat difficult to understand, but the main point seems to be that Meningococcus is regarded as the spore of an ascomycetous fungus. Further, the "filterable meningococcal virus" of an earlier paper of the author "probably represents a stage in the life-cycle of the ascomycetic organism." I cannot claim anything but a superficial acquaintance with Meningococcus, and do not wish to criticize Dr. Hort's statements on the genus as such; but, particularly in view of the exploded theories of many early nineteenth century biologists—such, for example, as that of Béchamp, who, about 1870, held that certain bacteria were capable of transforming into yeasts, and of the well-known pleomorphic extravagances of a few years earlier, when Hallier and his school placed Mucor, Empusa, Saprolegnia, and Saccharomyces in the same life-cycle—it is essential that we should have the strongest possible scientific evidence before regarding a diplococcus and a filterable virus as stages in the life-history of an Ascomycete.

It is on the mycological side that I would wish to point out certain criteria which are necessary before the organism described in the paper can be regarded as an Ascomycete. (There is little or no evidence given that it is even a fungus.)

The organism is described and drawn as spherical, with the power of budding. Within the body endospores are formed varying in number from two to eight, and, judging from the figures, the number of spores in the same ascus increases with age—for example, from three to eight in Culture 3. These endospores the author regards as the meningococcus of Weichselbaum.

To make clear to those who profess no knowledge of mycology the criticisms I have to offer, it may be well to emphasize the essential characters of an ascus, the organ which gives its name to one of the main groups of fungi.

An ascus is a sac containing, in the vast majority of cases, eight spores. It is generally subglobose in the lower forms such as Endomyces, Eurotium, etc., and club-shaped in the more evolved forms such as the ordinary cup fungi (Discomycetes). The spores arise by free-cell formation. There is a single nucleus in the ascus at its origin which, in those genera possessing ascogenous hyphae, arises from the fusion of two nuclei in the penultimate cell which gives rise to the ascus. The nucleus divides; a second and third division follow, and thus eight nuclei are formed. Part of the protoplasm accumulates around each of the nuclei, and these portions are delimited by a spore wall which is usually formed by astral rays from the nucleus. The remainder of the protoplasm (periplasm) is gradually absorbed by the growing spores. Although eight is the almost invariable number of spores in the ascus, variations occur. In some cases certain of the nuclei degenerate, and one, two, or four spores result, as the case may be; or further divisions of the original eight nuclei may take place (*Rhyparobius* spp.), and 16, 32, 64, etc., spores be formed; or, very rarely, the spores may bud inside the ascus (Exoascaceae). Yeasts are Ascomycetes, but the number of spores contained in the ascus is variable, ranging from one to twelve. In the most variable species—as, for example, those used in industry—the number, however, shows a certain fixity: thus *Saccharomyces cerevisiae*, in which the number of spores varies from one to five, has most frequently four. In Phycomycetes—for example, Mucor—the sporangium, which likewise contains internal spores though almost without exception indefinite in number, is multinucleate from its inception, and the spores are formed by the segmentation of the protoplasm, none of which remains over as periplasm.

Dr. Hort's terminology is difficult to follow; even more so is the chart of free-hand drawings of selected giant meningococci which he states is self-explanatory. The author is apparently so little aware of the extraordinary characters of the "ascomycetic organism" he has described that he has taken no trouble to prove that it is an ascomycete, apparently relying on the fact that internal spores are formed and that the vegetative cells undergo gemmation. How does the "ascus" described agree with a typical ascus? The young cells are drawn as being without cell contents, and so it is impossible to tell whether they are originally uninucleate, as are all young asci, and also what nuclear changes take place therein. The increase in the number of spores in the same ascus is not commented on, though it would be amazing in any fungus with so few spores, and is, of itself, sufficient to cast doubt on the whole paper. Does this "ascomycetic organism" differ from the rest of the fungi with endospores in that there is not simultaneous spore formation? If there is not simultaneous spore formation how does the number of spores increase? One would not expect the spores to increase by budding in such a form, though the difference in size of the spores, which is, so far as my memory serves, unique, may perhaps suggest that such takes place; but the relative positions in the cells is against this view, and the last four drawings seem to indicate that the difference in size is due to growth. Further, all non-motile fungus spores have definite cell-walls, whereas these are absent in Meningococcus. The author writes:

> There is as yet no evidence that the true meningococcus develops again directly into an ascus, as, on the contrary, undoubtedly do the ascal buds. For a time, at least, on solid laboratory media, equal binary fission of the meningococcus becomes stable and fixed, though I have been able to obtain evidence, at present incomplete, that some meningococci (endospores), either before or shortly after escape from the ascus, will show mycelial sprouting in suitable liquid media, and so complete the cycle. Considering, however, the tendency to suppression of the mycelial phase in many of the ascomycetes, it is perhaps not to be wondered at that the mycelial aspect is much more difficult to study in laboratory cultures of the meningococcus than is the ascal aspect.

This apparently means that, although the spores are placed in the conditions under which there is abundant vegetative growth, they refuse to germinate—an unexpected phenomenon. They behave, on solid media, as the meningococcus of the textbooks, but does the "true meningococcus" here mean the endospores? Endospores may show "mycelial sprouting," though it is not stated whether this is the vegetative budding described for the organism or the formation of a true mycelium. Vegetative budding, if such be meant, might explain the remarkable increase in the number of endospores before liberation; but the next sentence seems to suggest that it is a true mycelium the author intends, though the sentence as a whole indicates his lack of knowledge of fungus culture—asci are *always* more difficult to obtain than are vegetative phases.

Apparently Dr. Hort has been led to consider his organism near to the Saccharomycetes. A few of the camera lucida drawings suggest an organism similar to Torulospora, but the representations of budding in the chart are very unlike what one ever sees in cultures. But budding is not unknown in fungi other than Ascomycetes; it occurs in Basidiomycetes (for example, Calocera), Ustilagineae (for example, Ustilago), Fungi Imperfecti (for example, Dematium), in some cases even with alcoholic fermentation.

It may be thought that the statements in the author's conclusions:

> The so-called giant meningococcus is not a bacterium. It represents an ascal stage in the life-cycle of an organism allied to the ascomycetes.—

or in the footnote to this—

> Owing to the variable number of ascospores (meningospore) which the ascus (meningoascus) contains, and owing to the absence of perithecium, the organism here described is provisionally placed amongst the hemiascomycetes, instead of amongst the ascomycetes proper—

shelter him from much of the above criticism. But all fungi with asci *are* Ascomycetes. The Hemiascomycetes (Hemiasci of Brefeld) were a group which were characterized by having an indefinite number of spores in a single sporangium (not, be it remarked, a variation in number in the same sporangium), though with other characters suggesting Ascomycetes. The members of this group, supposedly intermediate between Phycomycetes and Ascomycetes, have, so far as studied, proved to belong definitely to one or other of these two groups. To use the term Hemiascomycetes for simple Ascomycetes (either primitive or reduced) is wrong both historically and scientifically. It would be of the greatest interest to mycologists to have definite proof that Meningococcus (or any such genus) is the spore of a fungus. But it is devoutly to be desired that workers making assertions on such matters should give satisfactory evidence when publishing their accounts. Dr. Hort is obviously not enamoured of bacteriology textbooks. Is it too much to ask that he should consult a mycologist before publishing any further account of his mycological researches?—I am, etc.,

J. RAMSBOTTOM,
Mycologist, British Museum.

Base Laboratory,
Salonica.

GENERAL PRACTITIONERS AND VENEREAL DISEASE.

SIR,—The article, "General Practitioners and Venereal Disease," in the issue of August 3rd, p. 119, seems to me so wide of the mark as to call for comment.

It implies that the army and navy hold some monopoly, as it were, of venereal disease, and whilst this is safely bottled up in the army, it will be dangerous when let loose.

If so, what about "leave"? Every man in the army and navy has leave now, so where is the difference? Any general practitioner knows that there is no difficulty with the army or navy contact, because of his high idea of personal hygiene. The danger lies in the disreputable and filthy "ne'er-do-well" civilian of both sexes. These are never in any army or navy, but once used to follow armies—harpies and ghouls to batten on the sick and wounded.

The males have adroitly evaded every regulation since 1914, or if by chance one gets into the army, it is only too glad to get rid of him quickly.

The females will neither pay for nor take advice or treatment until (what time they have spread disease broadcast) they become so bad as to necessitate their becoming inmates of some hospital, where they pass the time weaving embroidered lies about the inefficiency of some general practitioner. If they happen to be in medical benefit, which is rare, they pester some general practitioner to put them on his list, and defile his waiting-room and surgery to the consternation of his other patients.

Yet the article says the insurance practitioner is not "rising to the occasion." I say he has risen some long time ago and knows exactly how to treat them. Where has there ever been any difficulty in treating those whose instincts point to personal cleanliness? Is it not puerile and futile to talk of inadequate medical training when these living cesspools of squalor, dirt, and disease walk abroad unchecked and uncontrolled by any law, and rub one's very shoulders in tram, bus, and train. Our new army and navy, when they come home, may have a good deal to say on such matters, which will be straight to the point, but it is laughable in present circumstances to talk about the army as a source of evil.—I am, etc.,

F. W. HOGARTH, M.B., B.S.Lond.

Morecambe, Aug. 5th.

INSURANCE PRACTICE IN RURAL DISTRICTS.

SIR,—The contrast in the medical working of the Insurance Act is so marked in town and country practice in favour of the former that it is incredible to me that the long-suffering rural practitioner should patiently submit to what is undoubtedly gross unfairness from his point of view.

I doubt whether it is an exaggeration to say that a town panel of 2,000 can be worked with no more expenditure of time, energy, and money than a country panel of 1,000.

In towns patients mostly live within a small radius of the doctor, and not only does this shorten the time expended by him in visiting them, but undoubtedly their proximity to the surgery enormously lessens the number of visits he is called upon to make. So many people not feeling quite up to the mark would brave the few hundred yards of town street, who would regard themselves as

unfit for the one, two, or three miles or more of country road to the doctor's surgery.

It has been stated that country panel patients do not so frequently consult their doctor as those of the town by reason of difficulty of access. If this be so, it may in some degree lessen the number of those visiting the surgery; but it is not these patients that take up one's time; it is the visits of a mile or more, scattered about.

Country panel doctors are thoroughly discontented, and reasonably so. Either the mileage grant should be extended to cases over one mile or the capitation fee should be considerably raised for rural practitioners. Why does this patient, enduring slave of humanity not rebel? The fact is, he is so overwhelmed by the surging life that he has no time to think. A dull resentment fills him, but he is so fatigued both mentally and physically that the line of least resistance is taken. Can one imagine the so-called working man submitting to industrial tyranny such as this? I trow not.—I am, etc.,

August 6th. PIGET.

THE BURDEN OF COSTLY REMEDIES.

SIR,—The Insurance Act seems to be one of those

causes which conspire to blind
Man's erring judgement, and misguide the mind.

At least, one is tempted to think so from your recent editorial on the above subject, from divers letters which have since appeared in your columns, and from the diatribe delivered by the Chairman of the Representative Meeting, as reported in the BRITISH MEDICAL JOURNAL of August 10th, against the judgement of the Medical Commissioner. How anyone reading it could imagine that his remonstrance in the last paragraph was intended for Dr. Fisher personally passes my comprehension. Even my dull brain could see that it was aimed at the London and Counties Medical Protection Society, who are rebuked not for raising the question on behalf of their member, but for advising him, and for persisting on his behalf, to demand a full dress inquiry, with all its expensive paraphernalia of plaintiff, defendant, lawyers, and witnesses, into a question the facts of which were not in dispute, and on which a formal decision without a hearing had been offered by the Commissioners.

Dr. Bateman's letter shows that there was no misunderstanding of the purport of the judgement at the office of the Medical Defence Union, where some effort is evidently made to master the meaning of the agreements voluntarily entered into by panel practitioners.

But on the principle that any rope is good enough with which to hang a dog, with some people any excuse seems good enough for an attack on the Insurance Commissioners, and as they are precluded from replying in public, the game is as safe as any true sportsman could desire.—I am, etc.,

Nottingham, Aug. 20th. A. FULTON.

Obituary.

WILLIAM SELLERS, M.D.,

Professor of Forensic Medicine, Manchester University, and Coroner for the City.

BY the death of William Sellers, barrister-at-law, M.D.Lond., Professor of Forensic Medicine in the University of Manchester, and Coroner for the City of Manchester, Lancashire has lost a man who attained distinction in both law and medicine. He was the elder son of Dr. William Sellers, of Radcliffe, near Manchester. From the Manchester Grammar School he proceeded to Edinburgh and afterwards to London for his medical training. He graduated M.B.Lond. in 1880, and for twenty years afterwards he practised with great success as a doctor over an extensive district of which Radcliffe was the centre, first in conjunction with his father, and afterwards as partner with his brother, now Brevet Major Arthur Sellers, R.A.M.C.(T.), of the Manchester University Public Health Laboratory. He graduated M.D.Lond. in 1883 and took the D.P.H.Vict. in 1889, and for some years was medical officer of health for Radcliffe. In 1900 he abandoned the practice of medicine for the law, and was called to the bar at the Middle Temple. He joined the Northern Circuit, and practised at Manchester. He attached himself to the Common Law branch of his profession, where his wide knowledge and experience of medicine and surgery were calculated to be of most service; he obtained a recognized position in matters in which scientific questions of the nature indicated were involved, and he was concerned in a number of civil and criminal cases of the first importance of this character. As an advocate he was hardworking and resourceful, but always kindly and courteous, moderate and fair. Perhaps his most outstanding quality was the urbanity and geniality which were part of his nature. Judges and juries alike trusted him, and in great measure, no doubt, their confidence was gained by the reasonableness which characterized all he said and did. It was doubtless these qualities that led to his being frequently asked to sit as arbitrator or as deputy to several county court judges, and to his unqualified success when acting in either of these capacities. He showed, indeed, such manifest judicial qualities as marked him out distinctly for promotion to the county court bench had he not accepted an appointment as coroner, involving his retirement from the bar. His work as a coroner began as deputy coroner for the city of Manchester during the coronership of the late Mr. Gibson. Afterwards he was for some years coroner for the Salford Hundred of the county of Lancaster. Then in 1915 the coronership of the city of Manchester became vacant by the death of Mr. Gibson, and Mr. Sellers was appointed. Of his work as coroner the *Manchester Guardian* said that he was "characterized, perhaps above all, by an abounding sympathy with the sorrows and mental distress of many from whom it was his duty to obtain evidence; and in these cases his patience, tact, and kindness seldom failed to extract the information necessary to a right conclusion." Before his appointment as city coroner, and, indeed, by special request during part of the time that he held that office, he acted as independent chairman of various joint committees and boards representing employers and workpeople appointed to deal with questions affecting the relations of masters and men, and his wise counsel and moderate views gave him an influence which promoted peace and solved many difficulties. He did not lose touch altogether with the work of his old profession, for although he ceased resolutely to practise medicine in 1900, he published in 1906 *A Handbook of Legal Medicine*, and the high regard in which he was held was testified by his appointment as professor of forensic medicine at the Manchester University. He also for some years acted as examiner in forensic medicine at the University of Leeds, University College, Cork, University College, Galway, and University College, Dublin. He had travelled much, and played cricket in his younger days, fished, and was a swimmer of unusual power. His skill at billiards was far in excess of that of most amateurs. He played golf a good deal in recent years, and was at one time captain of the Poulton-le-Fylde Club. In his later years he took to yachting, and from his beautiful home at Thornton Lodge, near Fleetwood, where the waters of the Wyre estuary sometimes flowed into his garden, he could indulge his passion to his heart's content. He sailed and raced his own yacht, was a member of the Royal Mersey Yacht Club, was commodore for a time of the Blackpool and Fleetwood Yacht Club, and was known and beloved by every yachtsman and boatman on the Wyre and in that part of Morecambe Bay. His cheeriness, sympathy, and good nature endeared him to all who came in touch with him. And though there was sorrow in the hearts of the watchers, there seemed to be something peculiarly appropriate in the peaceful brightness of the beautiful summer afternoon when he was laid in his last resting place in a quiet grave by the seaside, with the waters of a full tide lapping almost to the spot where he was laid, and shining blue for miles to the sunlit hills across the bay. Around his grave were simple brown-faced boatmen mingled with representatives of law and medicine and university and civic life in a common tribute of affection and regret.

WITH much regret we announce the death on August 5th, at his residence, 1, Amhurst Park, N., of Dr. THEOPHILUS HOSKIN. He was born sixty-two years ago at Gelling's Park, Calstock. He received his medical education at University College, London, where he was demonstrator of anatomy and house-physician to Sir William Jenner. He took the diploma of M.R.C.S. in 1879 and that of L.R.C.P.Lond. in 1881. He practised first in Amhurst

Road and afterwards at Amhurst Park. Possessing a charming and amiable personality and being skilful as a physician and surgeon, his practice became one of the largest in the north of London. He was honorary physician to the London Female Guardian Society and to the Home for Invalid Women, Stoke Newington, and he was a trustee for various charitable institutions, besides being a justice of the peace for the County of London and a commissioner for income tax. He took an interest in the Hackney Volunteers, for whom he raised a considerable sum of money, and in recognition he was made an honorary member of the Corps. He was a member of the British Medical Association and a Fellow of the Royal Society of Medicine. He had been ill for several months and, on the advice of his friends, he went in May last to his country house in Cornwall, but returned to London a few weeks later as he derived no benefit there. An operation was performed, but he succumbed a few weeks later. The funeral took place on August 9th. The first part of the service was conducted at St. Andrew's Church, by Canon Gardiner, for forty years an intimate friend. The large congregation of patients and friends which assembled included a considerable number of the medical profession. The second part of the service was conducted at Golder's Green Crematorium, and the ashes will be deposited in the picturesque and historical little church of St. Enodoc, near Dr. Hoskin's house, St. Minver, Cornwall. He leaves a widow, a son, and a daughter to mourn for him. His son, Major Jenner Hoskin, R.A.M.C., has been serving in the East for the past three years.

DR. FREDERICK FAWSSETT of Louth, Lincolnshire, who died on August 6th, aged 83, received his medical education at Edinburgh University, King's College, and Paris, took the diploma of M.R.C.S.Eng. in 1858, and graduated M.D.Edin. in 1859. He was physician to the Louth Dispensary and Hospital, and consulting physician to the Mablethorpe Convalescent Home. He was a J.P. for the borough of Louth and the county of Lincoln, a member of the Lincoln Division of the British Medical Association and of the Royal Medical Society, Edinburgh, and a fellow of the Royal Geographical Society and of the Botanic Society of Edinburgh.

DR. GUSTAVE VERRIEST, one of the leading men in the Belgian profession, died suddenly at Saint-Cloud on June 25th, 1918. For twenty-five years he occupied the chair of internal pathology in the University of Louvain. He was one of the first to associate experimental research with bedside observation, and he established a laboratory in connexion with his clinic. He was president of the Belgian Academy of Medicine, and of the International Congress of Neurology held at Brussels in 1903. He was an officer of the Order of Leopold.

COLONEL ALEXANDER PORTER, Madras Medical Service (ret.), died in London on May 30th. He graduated as M.D. Queen's University, Ireland, in 1864, and became F.R.C.S.I. in 1872. He entered the I.M.S. as assistant surgeon on April 1st, 1865, after the service had been closed for five years, became surgeon in 1873, surgeon-major in 1877, brigade surgeon in 1886, and surgeon colonel in 1890. He retired in 1895. Almost the whole of his service, previous to his promotion to administrative rank, was spent in civil employment. From 1866 to 1874 he was civil surgeon of Akola, in Berar, with an interval when he acted in 1870-71 as sanitary commissioner of Berar; in April, 1874, he was appointed chemical examiner to the Government of Madras, and professor of chemistry in the Madras Medical College, and in March, 1886, he became principal of the college and professor of medicine. He was the author of a work entitled *Notes on the Pathology of Famine Diseases*, founded on experience in the great Madras famine of 1877.

THE Surgeon-General of the United States army has reported to the Military Affairs Committee of Congress against the admission of "drugless healers" to the medical corps of the army. He points out that the admission to the medical corps of osteopaths as such, and not having the degree of doctor of medicine, would meet with practically unanimous opposition from the medical profession of America and all allied countries. It would be justly regarded as lowering the standards, educational and professional, of the medical corps, and would have "a discouraging and detrimental effect upon efforts to secure officers for the corps both at present and in future, and on the general moral of the corps."

Medical News.

WE referred a fortnight ago to the work of the Chemical Warfare Medical Committee in this country. It may be interesting to add that there is a similar committee in France under the chairmanship of Professor Achard, which has investigated the action of the various gasses used by the enemy, and has issued a pamphlet for the information of medical officers.

EXPERIMENTAL work in the United States relating to the manufacture of poison gas for use in war has been placed under the direction of Major-General W. L. Sibert, who till recently commanded the first division of the American regular army in France, and was assigned as chief of a special department on gas defence. Experiments on war gas and masks have been divided among several branches of the Government, including the Ordnance and Medical Departments of the army. The most extensive work has been done by the Bureau of Mines, which established a special laboratory at Washington.

THE Hellenic Association, consisting of Greek doctors who have studied in France, was established to promote union between French and Greek members of the profession, and to further the development of French medical science in Greece. It has established a Society of Biology, and this year founded the Medico-Chirurgical Society of Athens, which has held several meetings.

THE first annual meeting of the American Association of Thoracic Surgery was held at Chicago on June 10th under the presidency of Dr. Samuel J. Meltzer of New York. Dr. Willy Meyer of New York was elected president for the ensuing year. The association has at present a membership of seventy-one.

A COURSE of lectures on malingering and self-inflicted injuries has been established in connexion with the clinical institutes of Milan. The first lecture was recently delivered by Dr. Cesare Biondi, professor of medical jurisprudence in the University of Siena. Others will be given by Professors Besta, Denti, Bellotti, Morlani, and Daccò.

THE main objects of the newly constituted American Association of Clinical Psychologists are to aid in establishing definite standards of professional fitness for the practice of psychology and to encourage research in problems relating to mental hygiene and corrective education. There are forty original members, all holding the degree of doctor in psychology and engaged in the clinical practice of that speciality in the United States.

AMONG the changes in the military establishment of the United States embodied in the Army Appropriation Act, is an increase in the medical department, which includes one assistant surgeon-general for service abroad during the present war with the rank of major-general, and two assistant surgeon-generals with the rank of brigadier-general; all are to be appointed from the medical corps of the regular army. The President is also authorized to appoint two major-generals and four brigadier-generals in the medical department of the national army. Members of the Medical Reserve Corps, who hitherto could not reach higher rank than that of major, will in future be eligible for promotion to the rank of colonel.

OPPENHEIM (*Wien. med. Woch.*, lxviii, 637-641) has adopted the following method of treating scabies at the Wilhelmina Hospital in Vienna. It only takes three hours and consists of four stages: (1) The naked body is rubbed over with soft soap for a quarter of an hour, the favourite sites for the runs, namely, the interdigital spaces, wrists, elbows, axillae, thighs, genitals, and nates, receiving special attention. (2) The patient is then put in a warm bath at 86° F. and scrubbed with soft soap for half an hour. (3) He then leaves the bath, and is smeared all over with Hardy's ointment (precipitated sulphur 25.0, potassium carbonate 10.0, vaseline 125.0), his body is wrapped round with a towel, and gloves and socks are worn. (4) At the end of two hours he is put in a bath again, the ointment is removed rapidly with soap, the skin dried and smeared with zinc paste (zinc oxide and talc āā 15.0, vaseline 30.0). Moderate itching lasts, it is said, for a few days, and then disappears. After an experience of more than 1,200 cases so treated Oppenheim very rarely treats scabies by any other method, even in private practice.

THE principle of fireless cooking, which consists of the retention of heat for as long as possible in the cooking vessel after the contents have been brought to the boil, is illustrated at the British Scientific Products Exhibition at King's College, London, by an interesting device shown by

Dr. Cornwell Round of Sydenham Hill. The method employed is to build up around the cooking vessel a series of covers of some material which is approximately air proof, preferably newspapers for the sake of economy. These newspaper sheets, to the number of thirty or more, are nested one within the other but not too tightly around the vessel, and so neatly connected together that they may be lifted as a whole by means of the protruding handle of the food container at the top. A number of "dead air" spaces are formed between the layers of paper, and, confined air being a non-conductor of heat, the conditions are secured for conserving the heat in cooked food, and for readily conveying such food from place to place. Though Dr. Round is patenting his invention, he has no objection to any one making the nested covers for his private use according to instructions in a leaflet he has printed. The merit of the contrivance is that, with the exception of the camp saucepan, the materials required are only such as are available in the ordinary household, and here it has an advantage over the hay box. Specimens of covers in other materials, such as cloth and metallic foil, are also on view.

Letters, Notes, and Answers.

In order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

The postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

QUERIES AND ANSWERS.

INCOME TAX.

CAPTAIN R.A.M.C.(T.F.) inquires whether the gratuity paid on completion of territorial medical service is taxable at the rate in force on the date when the gratuity is paid.

*** Yes, provided that the officer was serving for some portion of the financial year during which the gratuity was paid. Our correspondent possibly does not realize that the special "service" rates of income tax have been the same for the present and the two past years.

LETTERS NOTES, ETC.

TREATMENT OF MENINGITIS.

CAPTAIN H. M. CADE, R.A.M.C. (Officer in Charge District Cerebro-spinal Fever Laboratory, Ipswich), writes: What proof has Mrs. Fysh that iodine quickly absorbed through the unbroken skin finds its way into the cerebro-spinal fluid? I am very doubtful whether it would pass the barrier of the choroid plexus. Would she expect the endotoxins elaborated by the meningococcus to become neutralized by this method? Would she rely on sterilizing the throat as the sole means of treatment in a case of diphtheria? Mrs. Fysh has not brought forward any reliable evidence to cause me to change my opinion that iodine treatment in this class of disease is unscientific—it is empiricism at its worst.

*** We are prepared to receive a reply to the specific question in the first sentence above, but cannot, otherwise, continue this correspondence.

GOITRE, IN-CROOK ANKLE, AND STUNTED GROWTH.

DR. JAMES OLIVER (London, W.) writes: The three medical conditions which I have enumerated above are, even to the casual observer, now so apparent that it seems to me expedient to draw the attention of the medical profession specifically to them. They are conditions so far affecting females only, but from a national point of view their importance cannot be overrated. The goitrous enlargement of the neck may or may not be due to some mineralogical condition of the drinking water. The in-crook ankle, which is an inbending of the ankle-joint, is due to a weakened state of the capsular ligament of the ankle and is not necessarily associated with any alteration in the relationship of the plantar surface of the foot to the ground. It is most commonly unilateral. The bending is always inwards because the external malleolus descends lower than the internal malleolus on the astragalus. The phenomenon is intensified by a weakened condition of the tendinous attachments; it is caused by some deficiency or lack of proportion in the mineral content of our foodstuffs. That too large a percentage of our women to-day between the ages of 18 and 30 are undersized there cannot be the least shadow of a doubt, and this untoward condition is in my opinion largely attributable to errors in feeding during the first twelve months of life.

RECTAL INJECTION IN WOUND SHOCK.

MAJOR W. HAIG, D.S.O., R.A.M.C.(T.) writes: The concluding paragraph of Captain Norman Guion's article on "Blood transfusion in a field ambulance" (June 22nd, p. 696) recalls a very good result obtained in a regimental aid post from a rectal injection of saline solution. The patient was pulseless as the result of severe multiple shell wounds, and I feared he would die on the way to the field ambulance. Remembering the success of rectal saline in cases of *post-partum* haemorrhage in civil practice, I decided to try it. A teaspoonful of common salt was dissolved in a pint of hot water, and, by means of rubber tubing from a stethoscope and the barrel of a brass syringe (no enema syringe being available), this was slowly poured into the rectum. The result was most gratifying: the patient quickly revived, stood the journey to the field ambulance very well, and (I heard later) made a good recovery from his wounds. The method has the advantages of simplicity, rapidity, and freedom from risk of sepsis.

WOUND STRIPES.

DR. OSCAR HOLDEN (Southampton) writes: The modern military method of denoting upon the sleeves of soldiers the number of times they have been wounded in action is, as many other everyday incidents, not as new or original as may be imagined. In Schoolcraft's great work on *The History, Condition, and Prospects of the Indian Tribes*, it is stated that upon the grave-posts of old-time Indian chiefs various emblems were drawn; being, in fact, an epitaph in the pictorial writing of these tribes. Amongst other matters of family interest and individual distinctions were short vertical lines drawn usually immediately beneath the Totem, to indicate the number of times the deceased had been wounded in battle. Our modern systems and civilization have, perhaps quite unknowingly, gone back to the old pictorial methods used by the Indian tribes in the seventeenth century.

INTESTINAL OBSTRUCTION DUE TO ASCARIS.

MR. T. A. R. AIYAR, L.R.C.P. and S.Edin., L.F.P. and S.Glasg. (Sitiawan, Lower Perak, F.M.S.), writes: *Ascaris lumbricoides* is of common occurrence among the Indian labouring classes, especially in children. Recently I had to certify as to the cause of death in a male child, aged 5 years. The body was ill nourished and wasted. The cause of death was found to be inanition due to acute intestinal obstruction; the whole of the small intestines were packed with these worms of all sizes; over 120 were counted.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

Subscriptions to the Second Appeal.

The following subscriptions and donations to the Fund have been received during the week ending August 17th:

	£	s.	d.
Dr. Alfred Cox (monthly)	1	1	0
Lieut.-Colonel W. M. Dawson, R.A.M.C. ...	2	2	0
Dr. S. W. Carruthers ...	1	1	0
Dr. F. S. Palmer	2	2	0
Messrs. Steel Brothers and Co., Ltd.*	105	0	0
Sir James Barr	5	5	0
Staff Surgeon W. Kenneth Wills, R.N.V.R.... ...	5	0	0
Messrs. Burroughs, Wellcome and Co.	100	0	0
Dr. H. E. Belcher... ...	2	2	0
Dr. L. B. Poole	2	2	0
Dr. J. R. Keith	1	0	0
Captain H. E. H. Oakeley, S.A.M.C.	10	0	0
Captain R. M. Stewart, R.A.M.C.	1	1	0
Dr. Percy Hughes† ...	3	3	0
Dr. W. H. Rowlands† ...	2	2	0
Dr. C. L. Hawkins† ...	2	2	0
Dr. Ambrose†	2	2	0
Dr. Williams†	1	1	0
Dr. Coaker†	1	0	0
Mr. Beilby†	1	1	0
Small sums†	0	11	0

* Per Dr. Herbert Spencer. † Collected by Dr. Cameron Kidd.

Subscriptions to the Fund should be sent to the Treasurer, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W.1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

THE appointment of certifying surgeon for Avoca (Wicklow) is vacant.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Seven lines and under	0	6	0
Each additional line	0	0	9
Whole single column	4	0	0
Whole page	12	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive poste *restante* letters addressed either in initials or numbers.